SLV-X715ME/X715PS/X715SG/X815ME/X815PS/X815SG/X825AS X825MI/X825MN/X825MNB/X835AS/X835ME/X835MN

RMT-V181L/V181M/V181N/V185

SERVICE MANUAL

ME Model

SLV-X715ME/X715SG/X815ME/X815SG/
X825MN/X835ME/X835MN

E Model

SLV-X715PS/X815PS/X825MNB

Australian Model

SLV-X825AS/X835AS

South Africa Model

SLV-X825MI

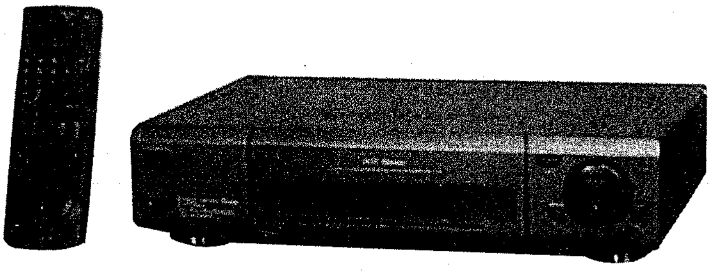

Photo: SLV-X835

- **Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENTS IV for MECHANICAL ADJUSTMENTS. (9-973-623-11)**

H MECHANISM

* The abbreviations of X715, X815, X825 and X835 contained in this service manual are indicated when these models are common to all their corresponding models as given below.

Abbreviated model name	X715	X815	X825	X835
All model names SLV-	X715ME X715PS X715SG	X815ME X815PS X815SG	X825AS X825MI X825MN X825MNB	X835AS X835ME X835MN

SPECIFICATIONS

System

Channel coverage
- VHF AS0 to AS12, AS5A, AS9A (X825AS/X835AS)
- VHF R1 to R12, E2 to E12 (X715/X815)
- VHF R1 to R12, E2 to E12, NZ1 to NZ9 (X825MN/X825MNB/X835ME/X835MN)
- VHF C1 to C12, SA4 to SA13 (X825MI)
- UHF AS28 to AS69 (X825AS/X835AS)
- UHF E21 to E69, R21 to R69 (EXCEPT X825AS/X825MI/X835AS)
- UHF C13 to C57, B21 to B69 (X825MI)
- CATV S01 to S05, S1 to S41

RF output signal
- UHF channels 30 to 39 (X715/X815)
- UHF channels 28 to 55 (EXCEPT X715/X815)

Aerial out
- 75-ohm asymmetrical aerial socket

Inputs and outputs

LINE-1 IN and LINE-2 IN
- VIDEO IN, phono jack (1 each)
- Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative

– Continued on next page –

VHS PAL NTSC

Hi-Fi VIDEO CASSETTE RECORDER

G-CODE

SONY®

MICROFILM

AUDIO IN, phono jack (1 each) (X715)
AUDIO IN, phono jack (2 each) (EXCEPT X715)
Input level: 327 mVrms
Input impedance: more than 47 kilohms

LINE OUT
VIDEO OUT, phono jack (1)
Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO OUT, phono jack (2)
Standard output: 327 mVrms
Load impedance: 47 kilohms
Output impedance: less than 10 kilohms

General

Power requirements
240 V AC, 50 Hz (X825AS/X835AS)
110 – 240 V AC, 50/60 Hz (EXCEPT X825AS/X835AS)

Power consumption
21 W (X715)
24 W (EXCEPT X715)

Operating temperature
5 ℃ to 40 ℃

Storage temperature
– 20 ℃ to 60 ℃

Dimensions
Approx. 430 × 109 × 323 mm (w/h/d) (X835)
Approx. 430 × 109 × 310 mm (w/h/d) (EXCEPT X835)
including projecting parts and controls

Mass
Approx. 4.5 kg (X835)
Approx. 4.3 kg (EXCEPT X835)

Supplied accessories

Remote commander (1)
R6 (size AA) batteries (2)
Aerial cable (1)
Audio/video cable (3 phono to 3 phono) (1) (EXCEPT X715)
Mains lead (1)
Plug adaptor (1)
(X715ME/X715SG/X815ME/X815SG/X835ME)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

- **Feature Difference**

SLV- **FEATURE**	**X715**	**X815ME/PS**	**X815SG**	**X825AS**	**X825MI**	**X825MN** **X825MNB**	**X835AS**	**X835ME/MN**
AUDIO SYSTEM	MONO	HiFi	MONO	HiFi	MONO	HiFi	HiFi	HiFi
OPERATING SWITCH BLOCK	×	×	×	×	×	×	○	○
PAL REC/PB	○/○	○/○	○/○	○/○	○/○	○/○	○/○	○/○
NTSC REC/PB	○/○	○/○	○/○	×/○	○/○	○/○	○/○	○/○
ME SECAM REC/PB	○/○	○/○	○/○	×/×	○/○	○/○	×/×	○/○
RF IN/OUT	BG/DK	BG/DK	BG/DK	BG	I/DK	BG/DK	BG	BG/DK
REMOTE COMMANDER RMT-	V181N	V181M	V181M	V181L	V181L	V181L	V185	V185

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SERVICE NOTE

1. UPPER DRUM REPLACEMENT (EXCEPT X715)

1-1. Removal of Upper Drum

1) Remove the screw ① (BV3 × 8) and take out the ground shaft assembly ②. (See Fig. 1.)
2) Completely remove the rotary upper drum board and desolder the soldering indicated by the arrows.
3) Remove two screw ③ (PSW3 × 8) and take out the rotary upper drum in the arrow direction Ⓐ. (See Fig. 2.)
   If it difficult, remove by shaking the rotary upper drum gradually.

Note: If the drum can not be removed, check whether the solders have been removed or not again.

1-2. Mounting Upper Drum

1) When inserting the rotary drum into the lower drum, be careful not to blur the contacting surface with fingerprint or the like.
2) Mount the rotary upper drum board so that the screw holes of both upper and lower drums match. (See Fig. 2.)
3) If it is difficult, mount the upper drum by shaking it gradually.
   Note: Be careful not to damage the head. Make sure that the upper drum is tightly inserted.
4) Tighten two screws ③ (PSW3 × 8). (See Fig. 2.)
   Note: Temporary tighten two screws. After making sure that upper drum is tightly inserted, tighten the screws.
5) Solder points on the board of the rotary upper drum.
6) Fix the ground shaft assembly ② using the screw ① (BV3 × 8) so that the protrusion of ground shaft assembly end contacts the center of the drum shaft.
   Note: When attaching the ground shaft assembly ②, be careful not to apply force to the spring section of it.

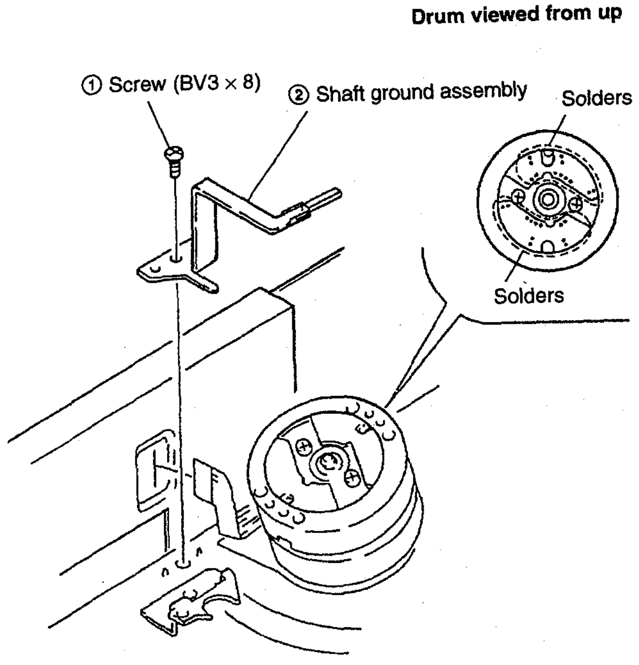


Fig. 1

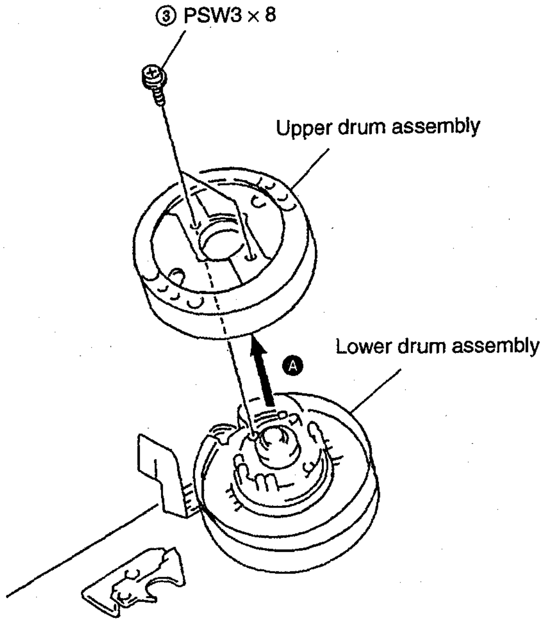


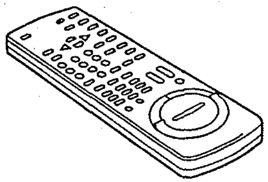
Fig. 2

Step 1

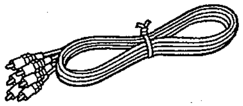
Unpacking

Check that you have received the following items with the VCR:

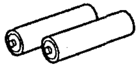
- Remote commander



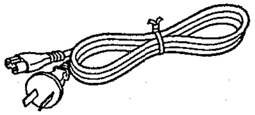
- Audio/video cable (3-phono to 3-phono)



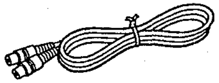
- R6 (size AA) batteries



- Mains lead



- Aerial cable

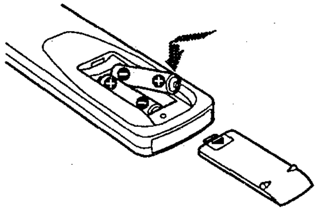


Step 2

Setting up the remote commander

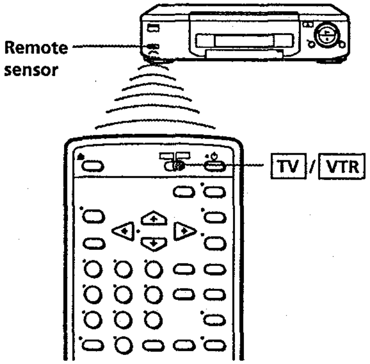
Inserting the batteries

Insert two R6 (size AA) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.



Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV.



To operate	Set TV/VTR to
the VCR	VTR and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

Notes

- The TV/VIDEO button selects an input sourse of the TV from aerial in or line in. The button does not control this VCR.
- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

continued

SECTION 1
GENERAL

This section is extracted from SLV-X835AS instruction manual.

Controlling other TVs with the remote commander

The remote commander is preprogrammed to control non-Sony TVs. If your TV is listed in the table below, set the appropriate manufacturer's code number.

1 Set TV/VTR at the top of the remote commander to TV.

2 Hold down ⏻, and enter your TV's code number(s) using the number buttons. Then release ⏻.

Now you can use the ⏻, VOL +/–, PROG +/–, programme number buttons, -/- - (ten's digit) and TV/VIDEO buttons to control your TV. You can also use the buttons marked with a dot (•) to control a Sony TV. To control the VCR, reset TV/VTR to VTR.

Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

Manufacturer	Code number
Sony	01,02,03,04,05
Aiwa	32
Akai	68
Blaupunkt	10,21
Brionvega	40
C.G.M	09
Dual	44
Fenner	30,31
Ferguson	52
Grundig	10,11
Hitachi	24
Hyper	31
Inno-Hit	41
Irradio	20

Manufacturer	Code number
ITT/Nokia	15,16
JVC	33
Loewe	45
Mitsubishi	27,28,50,51
Mivar	09
NEC	66
Nordmende	35,42
Orion	47,48
Panasonic	17,49
Philips	06,07,08
Pioneer	26
Phonola	18,19
Saba	12,13

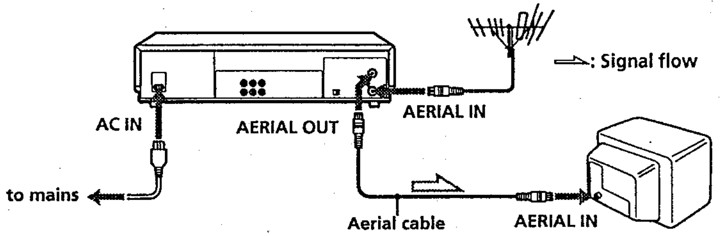
Manufacturer	Code number
Samsung	22,23
Sanyo	25
Schneider	46
Seleco	14
Sharp	29
Siemens	39
Sinudyne	37
TEAC	67
Telefunken	36
Thomson	43
Toshiba	38
White Westinghouse	34

Notes

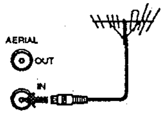
- If the TV uses a different remote control system from the one programmed to work with the VCR, you cannot control your TV with the remote commander.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote commander, the code number automatically resets to 01 (Sony). Reset the appropriate code number.

Step 3

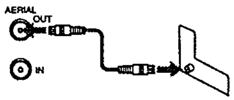
Connecting the VCR



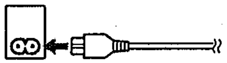
1 Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of the VCR.



2 Connect AERIAL OUT of the VCR and the aerial input of your TV using the supplied aerial cable.



3 Connect AC IN of the VCR to the mains using the supplied mains lead.

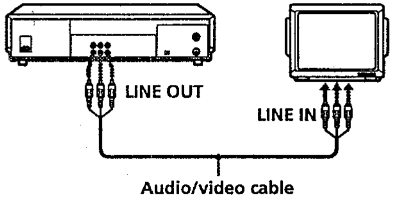


continued

Additional connections

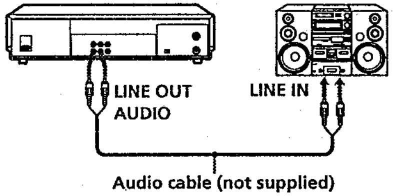
To a TV that has audio/video input jacks

This additional connection improves picture and sound quality. Connect the TV as shown on the right.


LINE OUT
LINE IN
Audio/video cable

To a stereo system

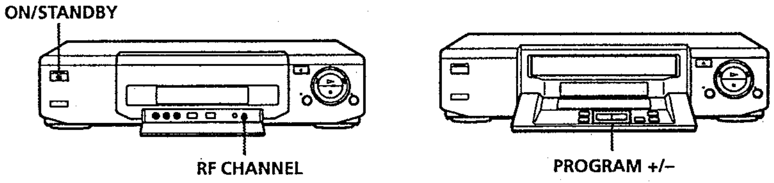
You can improve sound quality by connecting a stereo system as shown on the right.


LINE OUT
AUDIO
LINE IN
Audio cable (not supplied)

Step 4

Tuning your TV to the VCR

If you have connected your VCR to the TV using the audio/video cable, skip this step.


ON/STANDBY
RF CHANNEL
PROGRAM +/–

1

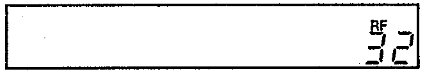
Press ON/STANDBY to turn on the VCR.

2

Press RF CHANNEL on the VCR.

The factory-preset RF channel appears in the display window.

The VCR signal is output through this channel to the TV.



3 Turn on your TV and select a programme position for the VCR picture.

This channel will now be referred to as the video channel.

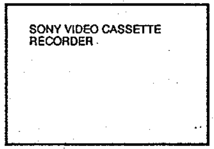
continued

4

Tune the TV to the same channel as that shown in the display window so that the picture on the right appears on the TV screen.

Refer to your TV manual for tuning instructions.

If the picture does not appear clearly, see "To obtain a clear picture from the VCR" below.



SONY VIDEO CASSETTE RECORDER

5

Press RF CHANNEL.

You have now tuned your TV to the VCR. From now on, whenever you want to play a tape, set the TV to the video channel.

To check to see if the TV tuning is correct

Set the TV to the video channel and press PROGRAM +/– on the VCR. If the TV screen changes to a different programme each time you press PROGRAM +/–, the TV tuning is correct

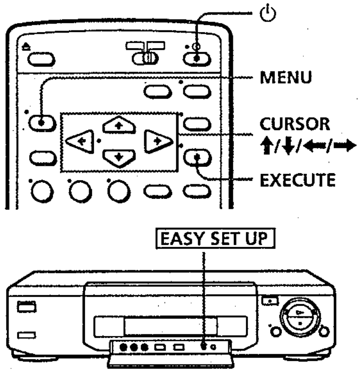
To obtain a clear picture from the VCR

If the picture does not appear clearly in step 4 above, press PROGRAM +/– in step 4, so that another RF channel appears. Then tune the TV to the new RF channel until a clear picture appears.

Step 5

Setting up the VCR with EASY SET UP

Before using the VCR for the first time, set up the VCR using the EASY SET UP function. With this function, you can set TV channels, guide channels for G-CODE, and the VCR clock, guided by the sequence indicated on the TV screen.



1

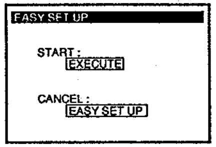
Press ⏻ to turn on the VCR.

2 Turn on your TV and set it to the video channel.

3

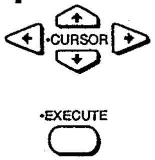
Press EASY SET UP on the VCR.

To cancel the EASY SET UP function, press EASY SET UP again.

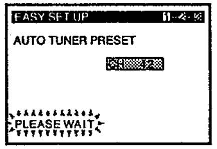


```
EASY SET UP

START :
  EXECUTE

CANCEL :
  EASY SET UP
```

4

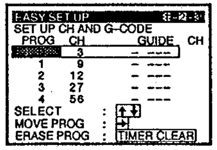


Press EXECUTE.



```
EASY SET UP
AUTO TUNER PRESET

PLEASE WAIT
```

The VCR starts searching for all the receivable channels.
During presetting, the channel being located is displayed on the screen. When all the channels are preset, the following screen appears.



```
EASY SET UP
SET UP CH AND G-CODE
 PROG   CH        GUIDE  CH
         3        - ---
   1     9        - ---
   2    12        - ---
   3    27        - ---
   4    56        - ---
SELECT      : ↑↓
MOVE PROG   : →
ERASE PROG  : TIMER CLEAR
```

continued

Step 5 : Setting up the VCR with EASY SET UP (continued)

5

Using CURSOR ↑/↓/←/→, set the G-CODE guide channels, change the programme positions of the stations, and disable the unused programme positions. (If not necessary, skip this step.)

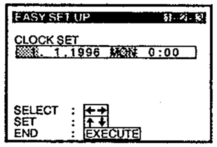
The setting procedures are the same as those described in "Manual setup — Setting up G-CODE" on page 18 and "Manual setup — Changing/disabling programme positions" on page 21.

6

Press EXECUTE.

The CLOCK SET menu appears.

Set the date and time using CURSOR ↑/↓/←/→. The setting procedures are the same as those described in "Manual setup—Setting the clock" on page 24.



EASY SET UP 1-2-3

CLOCK SET

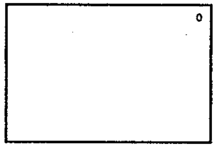
1. 1.1996 MON 0:00

SELECT : ←→
SET : ↑↓
END : EXECUTE

7

Press EXECUTE .

A programme position appears on the TV screen.

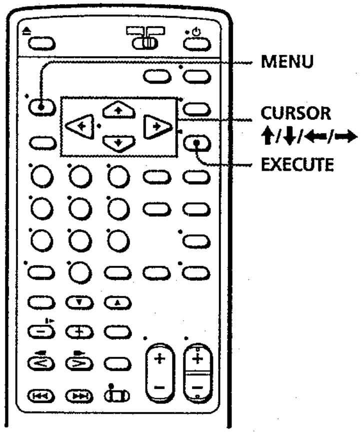


0

Note

- Do not exit EASY SET UP while the VCR is presetting channels. If you do, repeat EASY SET UP from the beginning.

Manual setup — Presetting channels



First, we recommend that you preset the receivable channels in your area using EASY SET UP or using automatic presetting below. Then, if some channels could not be preset automatically, you can preset them manually; if there are any unwanted channels among the preset ones, you can disable the channels.

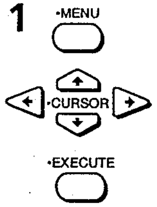
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

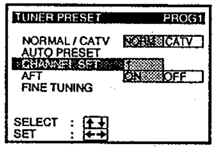
Presetting all receivable channels automatically

If you have preset the channels using the EASY SET UP procedure, skip this procedure.

1



Press MENU, then press CURSOR ↑/↓ to move the cursor (▶) to TUNER PRESET and press EXECUTE.



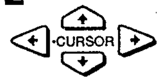
TUNER PRESET PROG1

NORMAL / CATV NORM CATV
AUTO PRESET
CHANNEL SET 1
AFT ON OFF
FINE TUNING

SELECT : ↑↓
SET : ←→

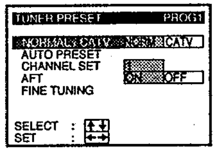
continued

2

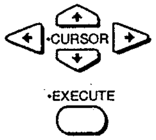


Press CURSOR ↑/↓/←/→ to move the cursor (▶) to NORMAL/CATV, then highlight NORM.

To preset CATV channels, highlight CATV.

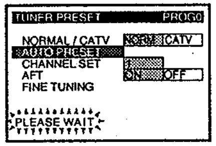

TUNER PRESET PROG1
NORMAL / CATV NORM CATV
AUTO PRESET
CHANNEL SET 1
AFT ON OFF
FINE TUNING
SELECT : ↑↓
SET : ←→

3

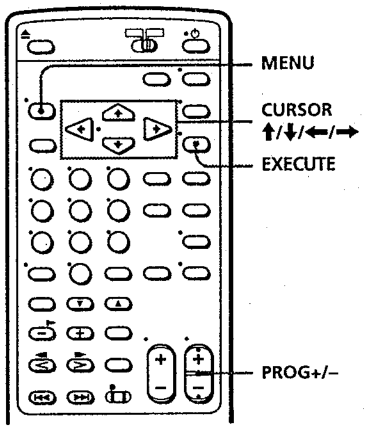


Press CURSOR ↑/↓ to move the cursor (▶) to AUTO PRESET, then press EXECUTE.

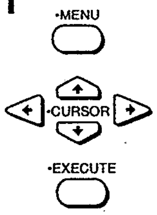
All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.


TUNER PRESET PROG0
NORMAL / CATV NORM CATV
AUTO PRESET
CHANNEL SET 1
AFT ON OFF
FINE TUNING
PLEASE WAIT

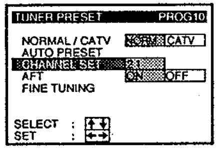
Presetting channels manually



1



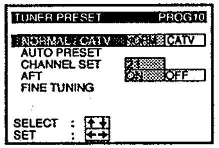
Press MENU, then press CURSOR ↑/↓ to move the cursor (▶) to TUNER PRESET and press EXECUTE.


TUNER PRESET PROG10
NORMAL / CATV NORM CATV
AUTO PRESET
CHANNEL SET 21
AFT ON OFF
FINE TUNING
SELECT : ↑↓
SET : ←→

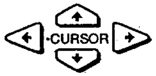
2

Press CURSOR ↑/↓/←/→ to move the cursor (▶) to NORMAL/CATV, then select NORM.

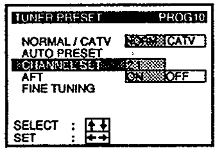
To preset CATV channels, select CATV.


TUNER PRESET PROG10
NORMAL / CATV NORM CATV
AUTO PRESET
CHANNEL SET 21
AFT ON OFF
FINE TUNING
SELECT : ↑↓
SET : ←→

3



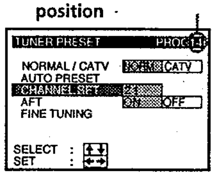
Press CURSOR ↑/↓ to move the cursor (▶) to CHANNEL SET.


TUNER PRESET PROG10
NORMAL / CATV NORM CATV
AUTO PRESET
CHANNEL SET 21
AFT ON OFF
FINE TUNING
SELECT : ↑↓
SET : ←→

continued

4

Press PROG +/– to select the programme position.

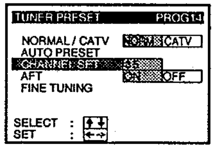

TUNER PRESET
PROG14
NORMAL / CATV
NORM
CATV
AUTO PRESET
CHANNEL SET
21
AFT
ON
OFF
FINE TUNING
SELECT :
SET :

Selected programme position

5

Press CURSOR ➡ repeatedly until the channel you want is displayed. Pressing CURSOR ⬅ goes back to the previous channels.

The channels are scanned in the following order:


TUNER PRESET
PROG14
NORMAL / CATV
NORM
CATV
AUTO PRESET
CHANNEL SET
35
AFT
ON
OFF
FINE TUNING
SELECT :
SET :

Channel coverage	
VHF	AS0 to AS12, AS5A, AS9A
UHF	AS28 to AS69
CATV (TV distribution)	S1 to S41, S01 to S05

If you know the number of the channel you want, press the programme number buttons. For example, for channel 5, first press "0" and then press "5."

6

To allocate another channel to another programme position, repeat steps 4 and 5.

7

Press EXECUTE.

Disabling unwanted programme positions

After tuning the TV channels, you can disable unused programme positions. The disabled positions will be skipped later when you press the PROG +/– buttons. You can also disable unwanted programme positions using the SET UP CH AND G-CODE menu (page 23).

1 In step 5 above, press programme number button "0" twice to display the number "0" beside CHANNEL SET.

2 Press EXECUTE.

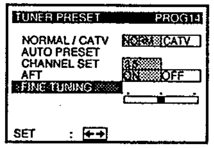
If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture is not clear, you may also use the manual tuning function.

1 Press PROG +/– to select the programme number for which you cannot obtain a clear picture.

2 Press MENU, then select TUNER PRESET and press EXECUTE.

3 Select FINE TUNING. The fine tuning meter appears.


TUNER PRESET
PROG14
NORMAL / CATV
NORM
CATV
AUTO PRESET
CHANNEL SET
35
AFT
ON
OFF
FINE TUNING
SET :

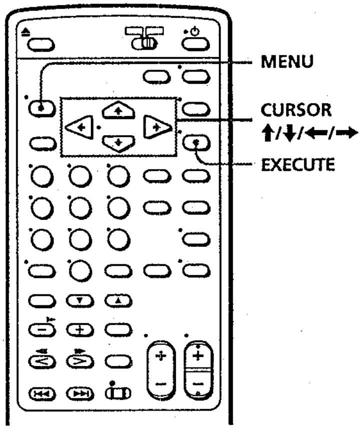
4 Press CURSOR ⬅/➡ to get a clearer picture, then press EXECUTE.

Note that the AFT (Auto Fine Tuning) setting switches to OFF.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

Manual setup — Setting up G-CODE



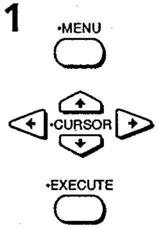
G-CODE is a feature in Sony VCRs that simplifies programming the VCR to make timer recordings. To use G-CODE, each programme position needs to be matched with its G-CODE guide channel. To get the guide channel numbers, look in the programme guide for your area that features G-CDOE numbers.

- If you want to record satellite broadcasts using G-CODE, see page 20.

Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

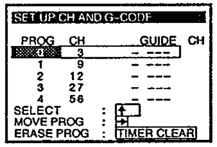
1



Press MENU, then press CURSOR ↑/↓ to move the cursor (I) to SET UP CH AND G-CODE and press EXECUTE.

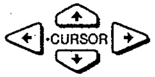
When using the EASY SET UP procedure, skip this step.

The preset channels are displayed on the screen.



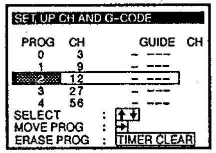
```
SET UP CH AND G-CODF

 PROG   CH        GUIDE  CH
   0     3        - ---
   1     9        - ---
   2    12        - ---
   3    27        - ---
   4    56        - ---
SELECT        : ↑
MOVE PROG     : →
ERASE PROG    : TIMER CLEAR
```

2



Press CURSOR ↑/↓ to move the cursor (I) to the row on which you want to set the guide channel.

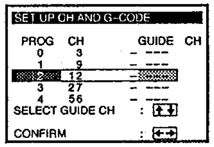
To display other pages for programme positions 5 to 49, press CURSOR ↑/↓ repeatedly.



```
SET UP CH AND G-CODE

 PROG   CH        GUIDE  CH
   0     3        - ---
   1     9        - ---
   2    12        - ---
   3    27        - ---
   4    56        - ---
SELECT        : ↑↓
MOVE PROG     : →
ERASE PROG    : TIMER CLEAR
```

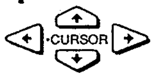
3

Press CURSOR → twice to highlight the guide channel column.

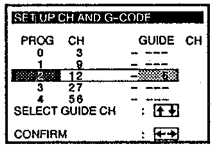


```
SET UP CH AND G-CODE

 PROG   CH        GUIDE  CH
   0     3        - ---
   1     9        - ---
   2    12        - ---
   3    27        - ---
   4    56        - ---
SELECT GUIDE CH       : ↑↓

CONFIRM               : ←→
```

4

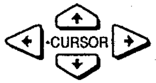


Press CURSOR ↑/↓ to select the guide channel number assigned in the programme guide.



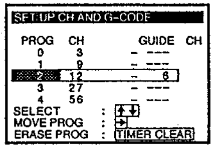
```
SET UP CH AND G-CODF

 PROG   CH        GUIDE  CH
   0     3        - ---
   1     9        - ---
   2    12        -    6
   3    27        - ---
   4    56        - ---
SELECT GUIDE CH       : ↑↓

CONFIRM               : ←→
```

5



Press CURSOR ←/→ to confirm the setting.

The cursor (I) appears in the leftmost column.



```
SET UP CH AND G-CODF

 PROG   CH        GUIDE  CH
   0     3        - ---
   1     9        - ---
   2    12        -    6
   3    27        - ---
   4    56        - ---
SELECT        : ↑↓
MOVE PROG     : →
ERASE PROG    : TIMER CLEAR
```

6

To set the guide channel of another station, repeat steps 2 to 5.

If you want to change the programme positions of the stations, proceed to step 2 of "Manual setup — Changing/disabling programme positions" on page 21.

7

Press EXECUTE.

continued

Setting up G-CODE for satellite broadcasts

When your satellite tuner is connected via the AERIAL IN connector, first you have to set the programme position for each satellite channel using the TUNER PRESET menu. Then set the guide channel number for each satellite channel using the SET UP CH AND G-CODE menu.

If your satellite tuner is connected via the LINE-1 IN jacks, you don't have to set programme positions nor guide channel numbers for satellite channels. Skip the following operations.

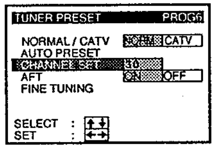
1 Turn on the satellite tuner.

2 Press MENU, then select TUNER PRESET and press EXECUTE.

3 Press PROG +/– to select a programme position you want to use for watching a satellite channel.

4 Select CHANNEL SET, then press CURSOR ➡ to tune the VCR to the satellite tuner.

The channel number displayed beside CHANNEL SET is used for receiving all satellite broadcasts from the satellite tuner.


TUNER PRESET PROG6
NORMAL / CATV NORM CATV
AUTO PRESET
CHANNEL SET 30
AFT ON OFF
FINE TUNING
SELECT : ↑↓
SET : ←→

5 Press PROG +/– to select another programme position for another satellite channel, and press the programme number buttons to enter the same channel number as the one displayed in step 4.

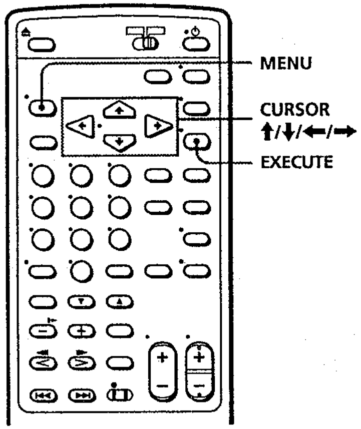
Repeat this step for all satellite channels.

6 Set the guide channel number for each programme position assigned to the satellite channel, following the procedures in "Manual setup — Setting up G-CODE" on page 18.

Notes

- The menu disappears automatically if you don't proceed for more than a few minutes.
- If you inadvertently entered a guide channel number, press CURSOR ↑/↓ repeatedly to reset the "GUIDE CH" column to "—." "—" appears between 1 and 255.
- The VCR does not allow entering the guide channel number, if the same number has been set.
- If you use a satellite tuner connected via the LINE-1 IN jacks, you don't have to setup G-CODE. Just record a satellite programme using G-CODE, and the VCR automatically records the programme from the LINE-1 IN jacks.
- When you record a satellite broadcast using G-CODE, you need to select the desired channel on the satellite tuner manually.

Manual setup — Changing/ disabling programme positions



After setting the channels and G-CODE guide channels, you can change the programme positions as you like. If any programme positions are unused or contain unwanted channels, you can disable them.

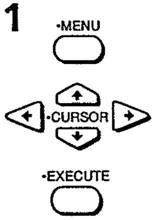
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

Changing programme positions

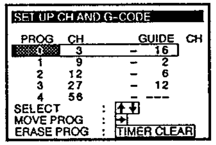
e.g. Moving the programme position from 2 to 0

1



Press MENU, then press CURSOR ↑/↓ to move the cursor (▮) to SET UP CH AND G-CODE and press EXECUTE.

When using the EASY SET UP procedure, skip this step.


SET UP CH AND G-CODE

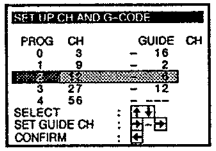
PROG	CH		GUIDE CH
0	3	–	16
1	9	–	2
2	12	–	6
3	27	–	12
4	56	–	---

SELECT : ↑↓
MOVE PROG : →
ERASE PROG : TIMER CLEAR

2

Press CURSOR ↑/↓ to move the cursor (▮) to the row on which you want to change the programme position, then press CURSOR ➡.

To display other pages for programme positions 6 to 50, press CURSOR ↑/↓ repeatedly.


SET UP CH AND G-CODE

PROG	CH		GUIDE CH
0	3	–	16
1	9	–	2
2	12	–	6
3	27	–	12
4	56	–	---

SELECT : ↑↓
SET GUIDE CH : → – →
CONFIRM : ←

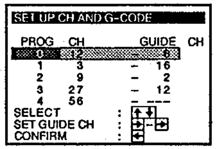
continued

Manual setup — Changing/disabling programme positions (continued)

3 •CURSOR

Press CURSOR ↑/↓ until the selected channel and guide channel row moves to the desired programme position.

The selected channel and guide channel are inserted at the new programme position and the intermediate channels are displaced to fill the gap.



```
SET UP CH AND G-CODE

 PROG   CH          GUIDE  CH
    0   12       -      6
    1    3       -     16
    2    9       -      2
    3   27       -     12
    4   56       -    ---
SELECT        : ↑↓
SET GUIDE CH  : →-→
CONFIRM       : ←
```

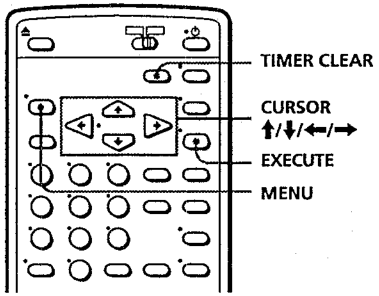
4 Press CURSOR ← to confirm the setting.

5 To change the programme position of another station, repeat steps 2 to 4.

6 •EXECUTE

Press EXECUTE.

Disabling unwanted programme positions



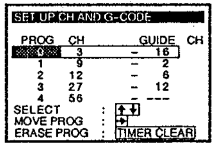
Note

- Be sure to select the programme position you want to disable correctly. If you disable a programme position by mistake, you need to reset that channel manually.

1 •MENU •CURSOR •EXECUTE

Press MENU, then press CURSOR ↑/↓ to move the cursor (I) to SET UP CH AND G-CODE and press EXECUTE.

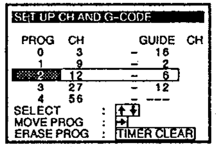
When using the EASY SET UP procedure, skip this step.



```
SET UP CH AND G-CODE

 PROG   CH          GUIDE  CH
    0    3       -     16
    1    9       -      2
    2   12       -      6
    3   27       -     12
    4   56       -    ---
SELECT        : ↑↓
MOVE PROG     : →
ERASE PROG    : TIMER CLEAR
```

2 •CURSOR

Press CURSOR ↑/↓ to move the cursor (I) to the row on which you want to disable.

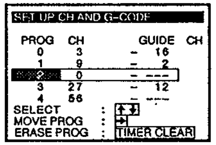


```
SET UP CH AND G-CODE

 PROG   CH          GUIDE  CH
    0    3       -     16
    1    9       -      2
    2   12       -      6
    3   27       -     12
    4   56       -    ---
SELECT        : ↑↓
MOVE PROG     : →
ERASE PROG    : TIMER CLEAR
```

3 TIMER CLEAR

Press TIMER CLEAR.

The selected row will be cleared as shown on the right.



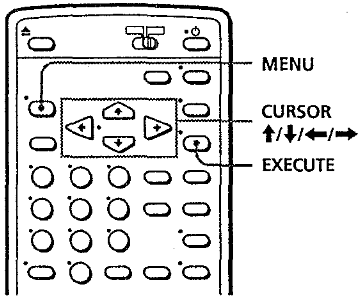
```
SET UP CH AND G-CODE

 PROG   CH          GUIDE  CH
    0    3       -     16
    1    9       -      2
    2    0       -    ---
    3   27       -     12
    4   56       -    ---
SELECT        : ↑↓
MOVE PROG     : →
ERASE PROG    : TIMER CLEAR
```

4 Repeat steps 2 and 3 for any other programme positions you want to disable.

5 •EXECUTE

Press EXECUTE.

Manual setup — Setting the clock

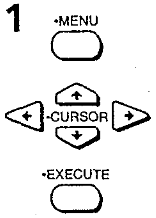


You must set the time and date on the VCR to be able to use the timer recording features properly. If you have not set the VCR clock in the EASY SET UP procedure, you need to set it manually.

Before you start...

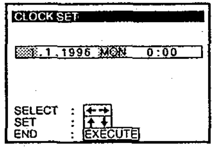
- Turn on the VCR and the TV.
- Set the TV to the video channel.

1



Press MENU, then press CURSOR ↑/↓ to move the cursor (I) to CLOCK SET and press EXECUTE.

When using the EASY SET UP procedure, skip this step.

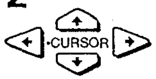


CLOCK SET

1.1.1996 MON 0:00

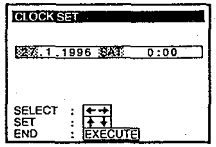
SELECT : ←→
SET : ↑↓
END : EXECUTE

2



Press CURSOR ↑/↓ to set the day.

The day of the week is set automatically.



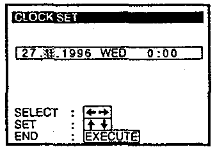
CLOCK SET

27.1.1996 SAT 0:00

SELECT : ←→
SET : ↑↓
END : EXECUTE

3

Press CURSOR → to highlight the month and set the month using CURSOR ↑/↓.

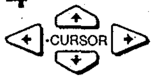


CLOCK SET

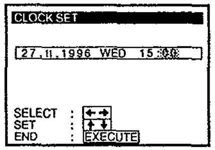
27.11.1996 WED 0:00

SELECT : ←→
SET : ↑↓
END : EXECUTE

4



Set the year, hour and minutes in sequence, using CURSOR → to highlight the item to be set, and CURSOR ↑/↓ to select the digits.



CLOCK SET

27.11.1996 WED 15:00

SELECT : ←→
SET : ↑↓
END : EXECUTE

5

Press EXECUTE to start the clock.

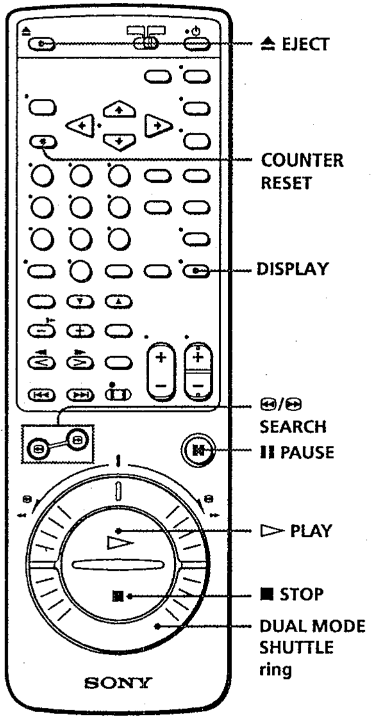
Tip

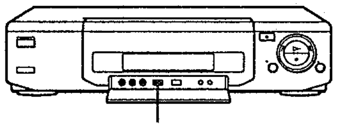
- To change the digits during setting, press CURSOR ← to return to the item to be changed, and select the digits using CURSOR ↑/↓.

Note

- The menu disappears automatically if you don't proceed for more than a few minutes.

Playing a tape





1 Turn on your TV and set it to the video channel.

2 Open the drop down panel and insert a tape.

The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.

3

Press ▷ PLAY.

When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	❚❚ PAUSE
Resume play after pause	❚❚ PAUSE or ▷ PLAY
Search forward	• Turn the DUAL MODE SHUTTLE (DMS) ring to ⊕ during playback • ⊕ SEARCH during playback
Search backward	• Turn the DMS ring to ⊖ during playback • ⊖ SEARCH during playback
Fast-forward the tape	Turn the DMS ring to ▶▶ FF during stop
Rewind the tape	Turn the DMS ring to ◀◀ REW during stop
Eject the tape	≜ EJECT

To set the color system

If streaks appear during playback, set COLOR SYSTEM on the VCR to confirm to the system that the tape was recorded in. (Normally set the switch to AUTO.)

If your tape was recorded in	Set COLOR SYSTEM to
PAL	PAL/MESECAM
NTSC	NTSC
MESECAM	PAL/MESECAM

To play an NTSC-recorded tape

Set NTSC PB at the rear of the VCR according to the color system of your TV.

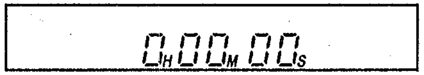
If your TV is	Set NTSC PB to
PAL	ON PAL TV
NTSC 4.43	NTSC 4.43
NTSC 3.58	NTSC 3.58

continued

Playing a tape (continued)

To use the time counter

At the point on the tape that you want to find later, press COUNTER RESET. The counter in the display window resets to "0H00M00S." Search for the point afterwards by referring to the counter.

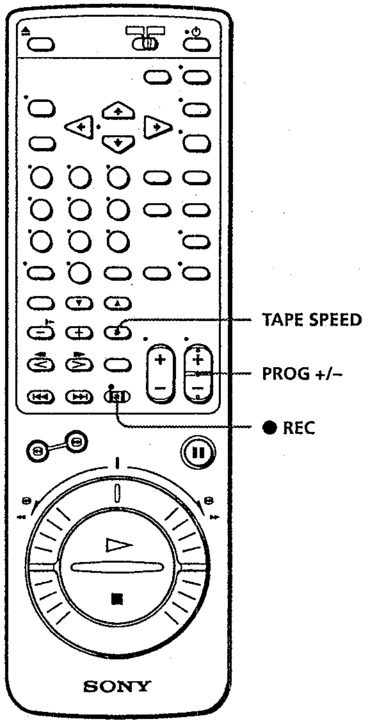


To display the counter on the TV screen, press DISPLAY.

Notes

- The counter resets to "0H00M00S" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This is due to the difference between the counting cycles of the two video systems.
- Depending on your TV, the following may occur while playing a NTSC-recorded tape:
  - the picture is black and white
  - the picture shakes
  - no picture appears on the TV screen
  - black streaks appear horizontally on the TV screen
  - the color density increases or decreases.

Recording TV programmes

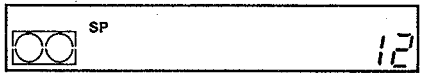


1 Turn on your TV and set it to the video channel.

2 Open the drop down panel and insert a tape with its safety tab in place.

3

Press PROG +/– to select the programme position you want to record.



continued

Recording TV programmes (continued)

4 TAPE SPEED

Press TAPE SPEED to select the tape speed, SP or LP.

LP provides recording time twice as long as SP, however, SP produces better picture and audio quality.

5 ●REC

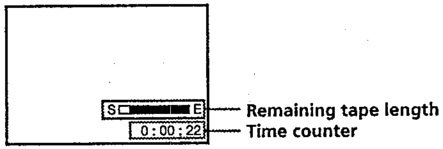
Press ● REC to start recording.

To stop recording

Press ■ STOP.

To check the remaining tape length

Press DISPLAY. The white bar indicates the approximate length of tape remaining.

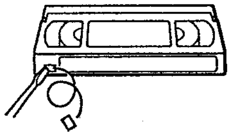


To watch another TV programme while recording

1. If the TV is connected to the VCR using an audio/video cable, set the TV to TV input. If the TV is connected to the VCR using only the aerial cable, skip this step.
2. Select another programme position on the TV.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.



Safety tab

To record NTSC color system programs

NTSC color signals can be recorded on this VCR.

For tape speed, select SP or EP in step 4.
EP provides recording time three times as long as SP, however, SP produces better picture quality.

When playing back, the VCR automatically detects the tape speed.

Tips

- To select a programme position, you can use the programme number buttons on the remote commander. For two-digit numbers, press the -/-- (ten's digit) button followed by the programme number buttons.
- You can select a video source from the LINE-1 IN or the LINE-2 IN jacks using INPUT SELECT.
- To cut out an unwanted scene while recording, press ❚❚ PAUSE and turn the DUAL MODE SHUTTLE ring on the VCR to rewind the tape to the beginning of the unwanted scene, then press ❚❚ PAUSE to resume recording.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV.

Notes

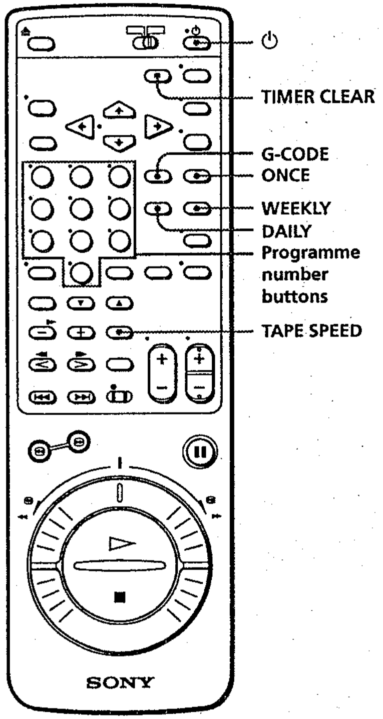
- The display does not appear during still (pause) mode or slow-motion playback.
- The display will not appear while playing an NTSC-recorded tape.

Recording TV programmes using G-CODE

Just enter the programme's G-CODE number listed in the TV programme guide. The date, times and programme position of that programme are set automatically. You can preset up to eight programmes at a time.

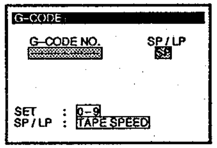
Before you start...

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.



1 G-CODE

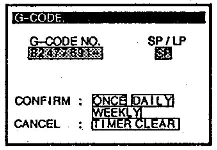
Press G-CODE.


G-CODE
G-CODE NO.
SP / LP
SET : 0–9
SP / LP : TAPE SPEED

2 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪

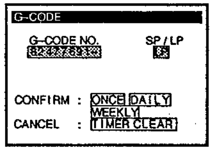
Press the programme number buttons to enter the programme's G-CODE number.

If you make a mistake, press TIMER CLEAR and re-enter the correct number.


G-CODE
G-CODE NO.
SP / LP
CONFIRM : ONCE DAILY WEEKLY
CANCEL : TIMER CLEAR

3 TAPE SPEED

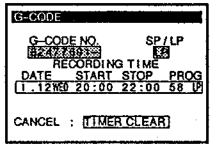
Press TAPE SPEED to select SP or LP.


G-CODE
G-CODE NO.
SP / LP
CONFIRM : ONCE DAILY WEEKLY
CANCEL : TIMER CLEAR

4 ONCE or DAILY or WEEKLY

Press ONCE, DAILY or WEEKLY:

To record	Press
Only once	ONCE
Everyday Monday to Friday	DAILY
Once a week	WEEKLY


G-CODE
G-CODE NO.
SP / LP
RECORDING TIME
DATE START STOP PROG
1.12WED 20:00 22:00 58 LP
CANCEL : TIMER CLEAR

The date, start and stop times, programme position, and tape speed appear on the TV screen.

If the information is not correct, press TIMER CLEAR to cancel the setting.

5 To enter another setting, repeat steps 1 to 4.

6 ⏻

Press ⏻ to turn off the VCR.

The TIMER indicator appears in the display window and the VCR stands by for recording.

To stop recording

To stop the VCR while recording, press ■ STOP.

continued

To record satellite broadcasts

If you connect the satellite tuner and the VCR, you can record satellite programmes.

1. Turn on the satellite tuner.
2. On the satellite tuner, select the satellite programme for which you wish to make a timer setting.
3. Repeat the steps described above.
4. Keep the satellite tuner turned on until the VCR finishes recording the satellite programme for which you have made a timer setting.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press ⏻. The TIMER indicator turns off and the VCR switches on. Remember to press ⏻ to reset the VCR after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV programme.

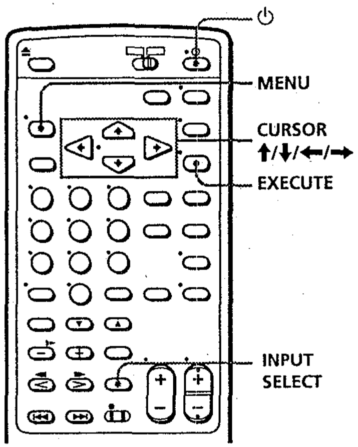
Tip

- To cancel the procedure, press G-CODE before pressing ONCE, DAILY or WEEKLY.

Note

- If the VCR beeps repeatedly, this means that:
  - The G-CODE number is incorrect.
  - ONCE, DAILY, or WEEKLY was selected incorrectly. You cannot select DAILY or WEEKLY for a programme that airs more than seven days ahead.

Setting the timer manually

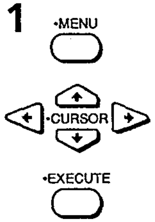


If G-CODE is not available in your area, follow the instructions below to set the timer to record programmes.

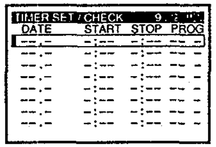
Before you start...

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.

1

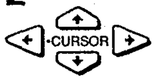


Press MENU and select TIMER SET/CHECK, then press EXECUTE.



```
TIMER SET / CHECK        9. 2
 DATE      START   STOP  PROG
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
```

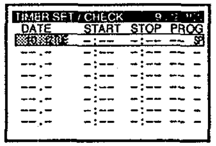
2



Set the date, start and stop times, programme position, and tape speed:

1. Press CURSOR → to highlight each item in turn.
2. Press CURSOR ↑/↓ to set each item.

To correct a setting, press CURSOR ← to return to that setting and reset.



```
TIMER SET / CHECK        9. 2
 DATE      START   STOP  PROG
 [illegible]  -:--    -:--  -- SP
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
 --.-      -:--    -:--  -- -
```

To record the same programme every day or the same day every week, press CURSOR ↓ while the date is highlighted. For details, see "Daily/weekly recording" on the next page.

To record from a source connected to the LINE-1 IN or the LINE-2 IN jacks, press INPUT SELECT to display "LINE1" or "LINE2" in the "PROG" position.

continued

Setting the timer manually (continued)

3 •CURSOR

Press CURSOR ➡ to confirm the setting.

The cursor (▮) appears at the top of the line. To enter another setting, move the cursor to the next line and repeat step 2.

4 •EXECUTE

Press EXECUTE.

5 •⏻

Press ⏻ to turn off the VCR.

The TIMER indicator appears in the display window and the VCR stands by for recording.

To record from other equipment, leave the connected equipment switched on.

To stop recording

To stop the VCR while recording, press ■ STOP.

Daily/weekly recording

In step 2 above, press CURSOR ⬇ to select the recording pattern. Each time you press CURSOR ⬇, the indication changes as shown below. Press CURSOR ⬆ to change the indication in reverse order.

the current date → SUN-SAT → MON-SAT → MON-FRI → EVERY SAT .....
→ EVERY MON → EVERY SUN → 1 month later →(cycles backward)
→ the current date

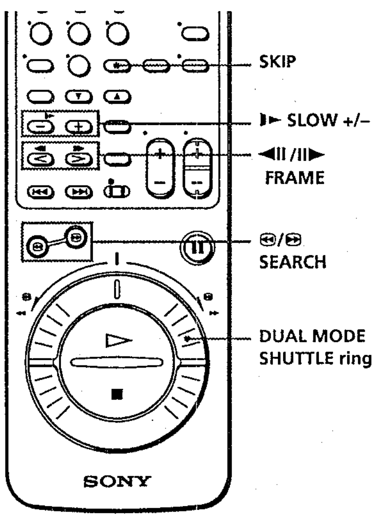
Tips

- To set the programme position, you can also use the PROG +/– or programme number buttons.
- To set the tape speed, you can also use TAPE SPEED.
- To record NTSC signals, set the tape speed to SP or EP. To set the EP mode, display "LP" in the tape speed position.

Note

- "TIMER" flashes in the display window when you press ⏻ with no tape inserted.

Playing/searching at various speeds



Playback options	Operation
Play at various speeds	During playback, turn the DMS ring and hold it at the speed you want.
Fast-forward/rewind	During stop, turn the DMS ring to ▶▶ FF or ◀◀ REW and release.
View the picture during fast-forward or rewind	During fast-forward, turn the DMS ring to ▶▶ FF. During rewind, turn the DMS ring to ◀◀ REW.
Play at twice the normal speed	During playback, turn the DMS ring to × 2.
Play at high speed	During playback or pause, press ⊕ SEARCH or ⊖ SEARCH. To change direction, press II▶ FRAME or ◀II FRAME.
Play in slow motion	During playback or pause, press ▶ SLOW +/–. Press the +/– buttons to change the speed. To change direction, press II▶ FRAME or ◀II FRAME.
Play frame by frame	During pause, press II▶ FRAME or ◀II FRAME. Hold the button down to play one frame each second.
Play in reverse	During playback, press ◀II FRAME.
Skip a scene	During playback, press SKIP. Pressing once skips about 30 seconds.
Rewind and start play	During stop, hold the DMS ring on the VCR at the ◀◀ REW position and press ▷ PLAY on the VCR, then release the DMS ring.

continued

To resume normal playback

Press ▷ PLAY.

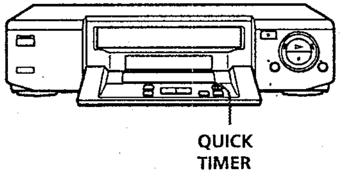
Tip

- Adjust the picture using ▼/▲ TRACKING NORMAL/SLOW STILL ADJUST if:
  - streaks appear while playing in slow motion.
  - bands appear at the top or bottom while pausing.
  - the picture shakes while pausing.

Notes

- The playback sound is muted during these operations.
- In the LP mode, noise may appear or there may be no colour.

Recording TV programmes using the quick timer



After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.

1 While recording, press QUICK TIMER on the VCR once.

2 Press QUICK TIMER repeatedly to set the duration.

Each press advances the time in increments of 30 minutes.

→ 0:00 → 0:30 → 1:00 ----→ 10:30 → 11:00 ┐

The duration decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press QUICK TIMER repeatedly to set to the new duration.

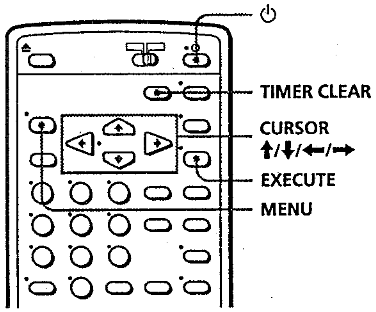
To stop recording

To stop the VCR while recording, press ■ STOP.

Tip

- You can also set the quick timer and start recording during the stop mode.

Checking/ changing/ cancelling timer settings



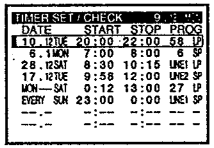
Before you start...

- Turn on your TV and set it to the video channel.

1 Press ⏻ to turn on the VCR.

2 Press MENU, then select TIMER SET/CHECK:

- If you want to change a setting, go on to the next step.
- If you do not need to change the settings, press EXECUTE, then turn off the VCR to return to recording standby.



```
TIMER SET / CHECK         9.12
 DATE        START  STOP  PROG
 10.12TUE   20:00  22:00  58 LP
  6.1MON     7:00   8:00   6 SP
 28.12SAT    8:30  10:15 LINE1 LP
 17.12TUE    9:58  12:00 LINE2 SP
 MON—SAT     0:12  13:00  27 LP
 EVERY SUN  23:00   0:00 LINE1 SP
 --.-       -:--   -:--  -- -
 --.-       -:--   -:--  -- -
```

3 Press CURSOR ↑/↓ to select the setting you want to change or cancel:

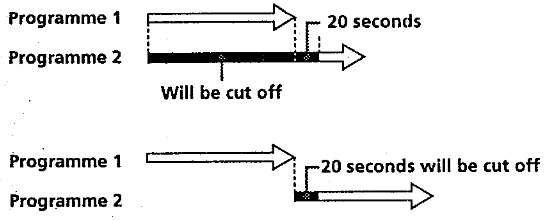
- To change the setting, press CURSOR ←/→ to highlight the item you want to change, and press CURSOR ↑/↓ to reset it. Then, press CURSOR → repeatedly until the cursor (**I**) appears at the top of the line.
- To cancel the setting, press TIMER CLEAR.

4 Press EXECUTE.

If any settings remain, turn off the VCR to return to recording standby.

When the timer settings overlap

The programme that starts first has priority and the second programme starts recording only after the first programme has finished. If the programmes start at the same time, the programme listed first in the menu has priority.



Recording stereo and bilingual programs

This VCR automatically receives and records stereo and bilingual programmes. When a stereo or bilingual programme is received, the STEREO indicator appears in the display window.

To select the sound while recording

Press AUDIO MONITOR to select the sound you want.

Stereo programme

To listen to	On-screen display	Display window
Stereo	STEREO	STEREO
Standard sound*	No indicator	No indicator

* Usually the mixed sound of left and right channels (monaural)

Bilingual programme

To listen to	On-screen display	Display window
Main	MAIN	STEREO
Sub	SUB	STEREO
Main and sub	MAIN/SUB	STEREO
Standard sound*	No indicator	No indicator

* Usually the main sound (monaural)

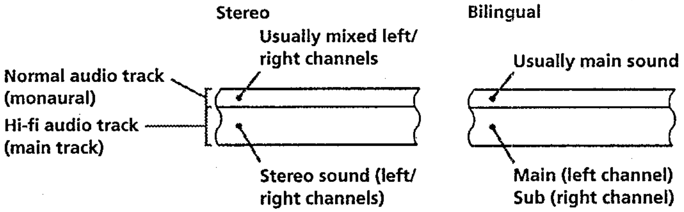
Selecting the sound during playback

Press AUDIO MONITOR to select the sound you want.

To listen to	On-screen display	Display window
Stereo/main and sub (left and right channels)	STEREO	STEREO
Left channel/main	LCH	STEREO
Right channel/sub	RCH	STEREO
Standard sound	No indicator	No indicator

How sound is recorded on a video tape

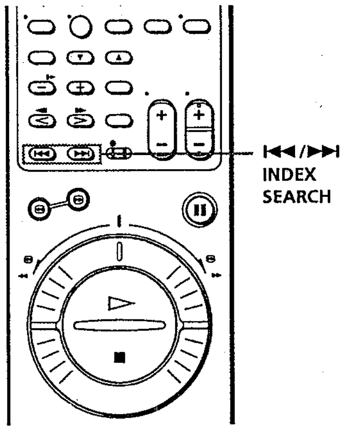
The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.


Stereo
Bilingual
Usually mixed left/ right channels
Usually main sound
Normal audio track (monaural)
Hi-fi audio track (main track)
Stereo sound (left/ right channels)
Main (left channel) Sub (right channel)

Notes

- To play a tape in stereo, you must use the AUDIO OUT connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that AUDIO MIX in the SET UP MENU is set to OFF.
- If HIFI AUDIO is set to STD, the standard sound will be recorded on both the hi-fi and normal audio tracks. Pressing AUDIO MONITOR will not change the sound.

Searching using the index function

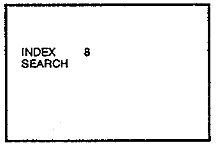


The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 99 index signals ahead of or behind the current position.

1 Insert an indexed tape into the VCR.

2 Press I◀◀/▶▶I INDEX SEARCH repeatedly to specify how many index signals ahead or behind you want to search:

- To search ahead, press ▶▶I INDEX SEARCH.
- To search backwards, press I◀◀ INDEX SEARCH.


INDEX 8
SEARCH

The VCR starts searching and the index number on the TV screen counts down to zero. Playback starts automatically from that point.

To stop searching

Press ■ STOP.

Note

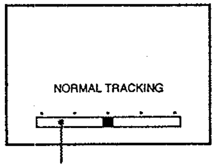
- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the channel during recording pause.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the AUTO TRACKING indicator flashes in the display window, then lights steadily), distortion may occur if the tape was recorded in poor condition. If so, manually adjust the tracking.

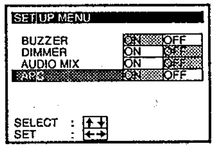
Press ▼/▲ TRACKING NORMAL/SLOW to display the tracking meter. The distortion should disappear as you press one of the two buttons. If you cannot get a clear picture with manual adjustment, press TRACKING AUTO/MANUAL to return to automatic adjustment.



Tracking meter

About Adaptive Picture Control (APC)

Adaptive Picture Control (APC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON in the SET UP MENU (with the APC indicator in the display window lit).


SET UP MENU

BUZZER	ON	OFF
DIMMER	ON	OFF
AUDIO MIX	ON	OFF
APC	ON	OFF

SELECT : ↑↓
SET : ←→

APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

APC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

To deactivate the APC

Press MENU and select SET UP MENU, then set APC to OFF. The APC indicator in the display window goes off.

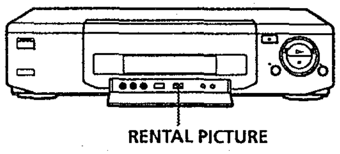
Note

- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyses the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press ● REC to have the VCR analyse the tape (the APC indicator flashes rapidly). After the APC indicator stops flashing, press II PAUSE to start recording immediately. If you want to start recording quickly without using the APC function, first set the VCR to recording pause (the APC indicator flashes slowly) and press II PAUSE to start recording.

continued

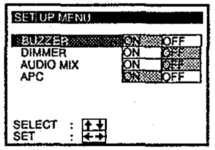
Reducing streaks and/or snow

If you are not satisfied with the picture quality while playing a tape, even when the APC is on, try to set RENTAL PICTURE on the VCR to ON.



Changing menu options

1. Press MENU, then select SET UP MENU.



2. Press CURSOR ↑/↓ to select the option to change, then press CURSOR ←/→ to change the setting.
3. Press EXECUTE to return to the original screen.

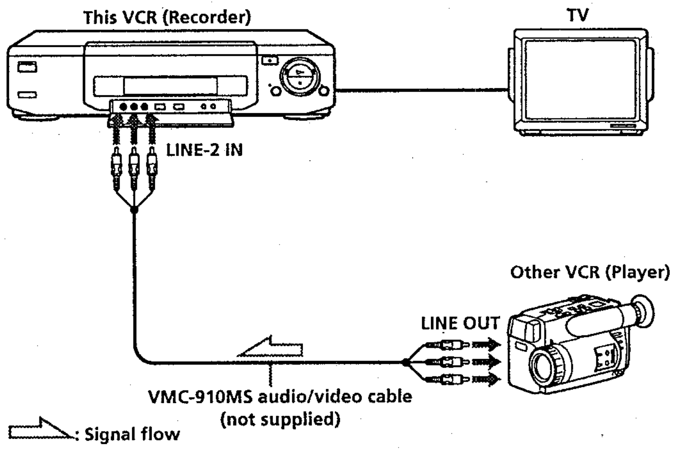
Menu choices

Initial settings are indicated in bold print.

Menu option	Set this option to
BUZZER	**ON** to output a beep sound when all illogical operation is made. OFF to deactivate it.
DIMMER	ON to make the display window dim, **OFF** to make it brighter.
AUDIO MIX	ON to listen to the hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function. **OFF** to listen to hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button.
APC	**ON** to switch on the APC (Adaptive Picture Control) function and improve picture quality, OFF to switch off APC.

Connecting to a VCR or stereo system

How to connect to record on this VCR



Tips

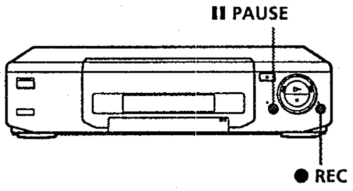
- Make sure you connect the plugs to jacks of the same colour.
- If the other VCR is a monaural type, leave the red plugs unconnected.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.
- You can also use the LINE-1 IN jacks instead.

How to connect to a stereo system

Connect LINE-2 IN AUDIO on this VCR to the audio output jacks on the stereo system, using the RK-C510KS audio cable (not supplied).

Basic editing

(when recording on this VCR)



Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" in the display window.
- Press TAPE SPEED to select the tape speed (SP or LP for the PAL system, and SP or EP for the NTSC system).

1. Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.
2. Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press ❚❚ PAUSE.
3. Press ● REC on this VCR and set it to recording pause.
4. To start editing, press the ❚❚ PAUSE buttons on both VCRs at the same time.

To stop editing

Press the ■ STOP buttons on both VCRs.

Tips

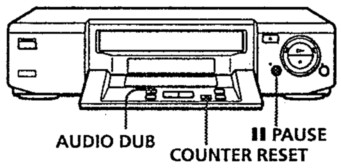
- To edit more precisely, press the ❚❚ PAUSE buttons on the VCRs to release pause.
- To cut out unwanted scenes while editing, press ❚❚ PAUSE on this VCR when an unwanted scene begins. When it ends, press ❚❚ PAUSE again to resume recording (Assemble Editing).

Note

- If you start recording following the procedure above, the VCR won't start recording with the APC function. To record a tape with the APC function, press ● REC again during recording pause in step 3 so that the VCR analyses the tape. Then when you start recording in step 4, press ❚❚ PAUSE after the APC indicator stops flashing. If you press ❚❚ PAUSE before the APC indicator stops flashing, the APC function is cancelled.

Audio dubbing

This feature lets you record over the normal audio track. The monaural sound previously recorded is replaced while the original hi-fi sound remains unchanged. Use this feature to add commentary to a tape that you have recorded with a camcorder.



Before you start dubbing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" in the display window.

1 Insert a source tape into the stereo system (or the playback VCR). Search for the point to start playback and set it to playback pause.

2 Open the drop down panel and insert a prerecorded tape into this (recording) VCR. Search for the end of the section to be replaced and press **II** PAUSE. Make sure that the tape has its safety tab in place.

3 Press COUNTER RESET on this VCR to reset the counter to "0H00M00S."

4 Rewind the prerecorded tape to the beginning of the section to be replaced.

The VCR pauses.

5 Press AUDIO DUB.

The audio dubbing indicator ⊖ appears in the display window.

6 To start editing, press the **II** PAUSE buttons on this VCR and the stereo system (or other VCR) at the same time.

When the counter reaches "0H00M00S," audio dubbing stops automatically.

To stop while editing

Press the ■ STOP buttons on this VCR and the stereo system (or other VCR).

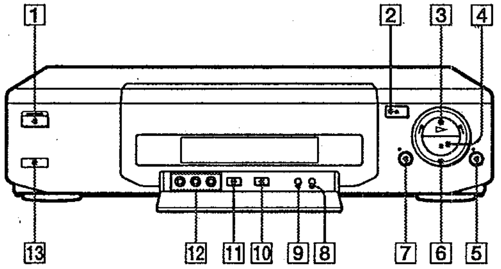
To listen to both the hi-fi and normal audio

Set AUDIO MIX to ON in the SET UP MENU (page 47). Use this feature to listen to dubbed audio over the original hi-fi audio. When AUDIO MIX is set to ON, the AUDIO MONITOR button does not function. Remember to reset AUDIO MIX to OFF after playing the tape.

Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

Front panel



1 ON/STANDBY switch/indicator (9)

2 ≜ EJECT button (27)

3 ▷ PLAY button (26)

4 ■ STOP button (27, 30)

5 ● REC button (30)

6 DUAL MODE SHUTTLE ring (27, 37)

7 **II** PAUSE button (27, 49)

8 RF CHANNEL button (9)

9 EASY SET UP button (11)

10 RENTAL PICTURE swich (46)

11 COLOR SYSTEM swich (27)

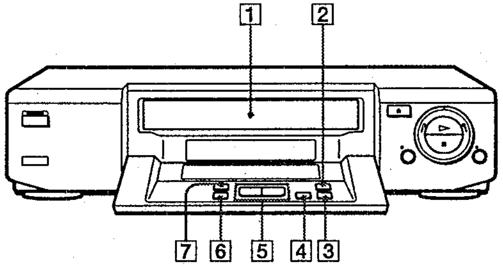
12 LINE-2 IN VIDEO/AUDIO L/R jacks (48)

13 Remote sensor

continued

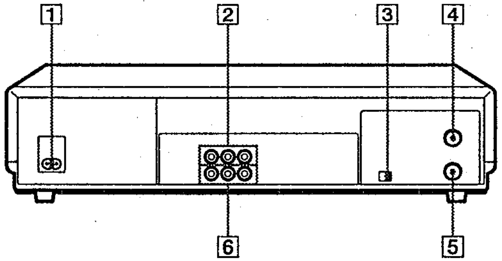
Index to parts and controls (continued)

Front panel, with cover opened



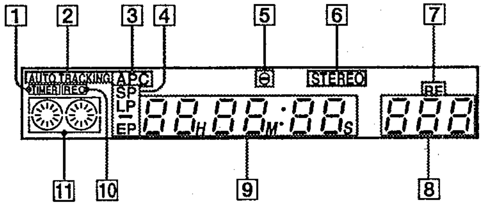
1. Tape compartment
2. QUICK TIMER button (39)
3. TAPE SPEED button (30)
4. COUNTER RESET button (28)
5. PROGRAM +/– buttons (10)
6. INPUT SELECT button (31, 49)
7. AUDIO DUB button (50)

Rear panel



1. AC IN connector (7)
2. LINE-1 IN VIDEO/AUDIO L/R jacks (48)
3. NTSC PB switch (27)
4. AERIAL OUT connector (7)
5. AERIAL IN connector (7)
6. LINE OUT VIDEO/AUDIO L/R (8)

Display window

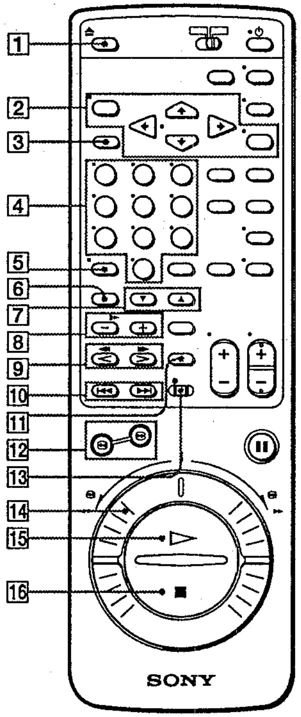


1. TIMER indicator (33, 36)
2. AUTO TRACKING indicator (45)
3. APC indicator (45)
4. Tape speed indicator (30)
5. Audio dub indicator (50)
6. STEREO indicator (42)
7. RF indicator (9)
8. Line/programme position indicator (9, 29)
9. Time counter/clock (28)
10. REC indicator
11. Tape indicator

continued

Index to parts and controls (continued)

Remote commander



1 ⏏ EJECT button (27)

2 Menu buttons (14)

MENU button
CURSOR ↑/↓/←/→ buttons
EXECUTE button

3 COUNTER RESET button (28)

4 Programme number buttons (31, 32)

5 -/-- (ten's digit) button (31)

6 TRACKING AUTO/MANUAL button (45)

7 ▼/▲ TRACKING NORMAL/SLOW STILL ADJUST buttons (45)

8 ❚► SLOW +/– buttons (37)

9 ◄❚❚/❚❚► FRAME </> buttons (37)

10 ◄◄ /►►❚ INDEX SEARCH buttons (44)

11 INPUT SELECT button (31, 49)

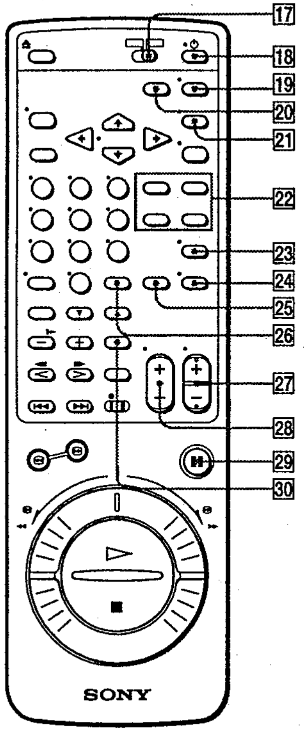
12 ⏪/⏩ SEARCH buttons (27)

13 ● REC button (30)

14 DUAL MODE SHUTTLE ring (27, 37)

15 ▷ PLAY button (27)

16 ■ STOP button (27)



17 TV / VTR remote control switch (5, 6)

18 ⏻ (on/standby) switch

19 TV/VIDEO button (*for TV*) (6)

20 TIMER CLEAR button (23, 33, 40)

21 AUDIO MONITOR button (42, 50)

22 G-CODE buttons (32)

G-CODE button
ONCE button
DAILY button
WEEKLY button

23 WIDE button
switches the wide mode of a Sony wide TV.

24 DISPLAY button (30)

25 AUDIO DUB button (50)

26 SKIP button (37)

27 PROG +/– buttons (16, 29)

28 VOL +/– buttons (*for TV*)

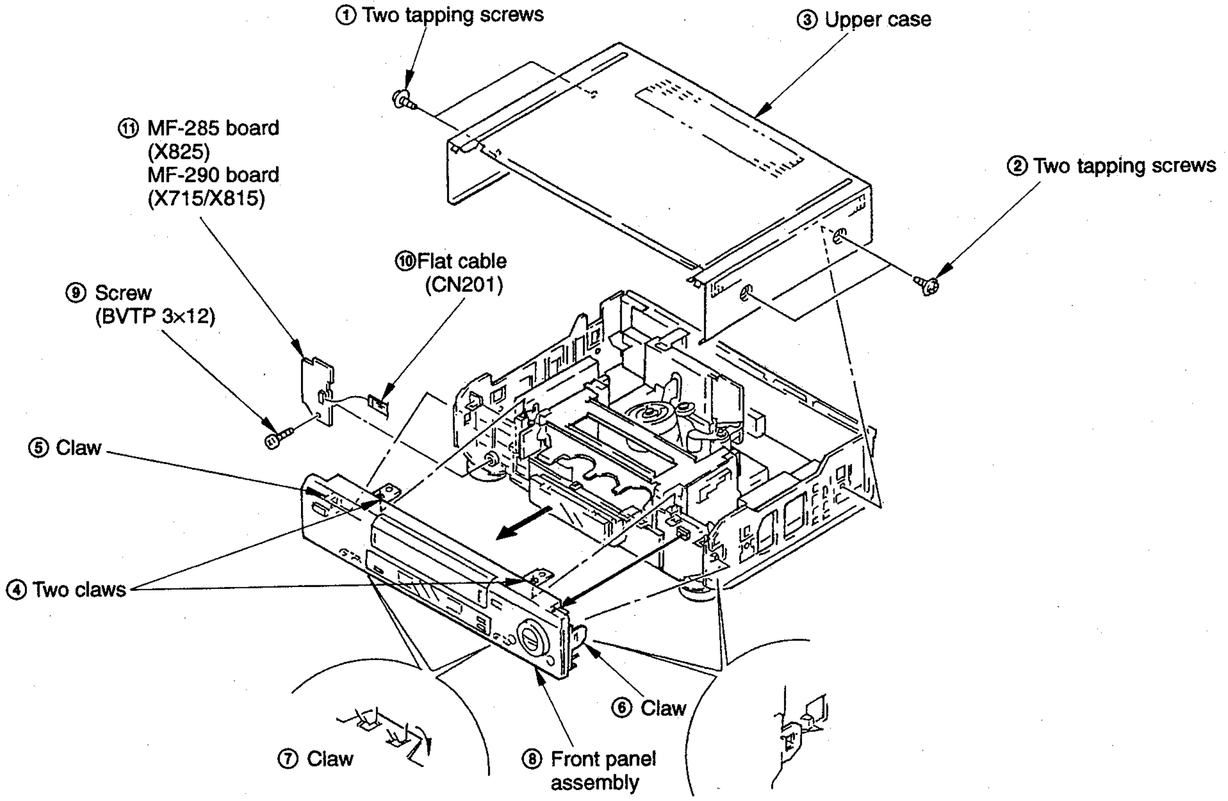
29 ❚❚ PAUSE button (27)

30 TAPE SPEED button (30)

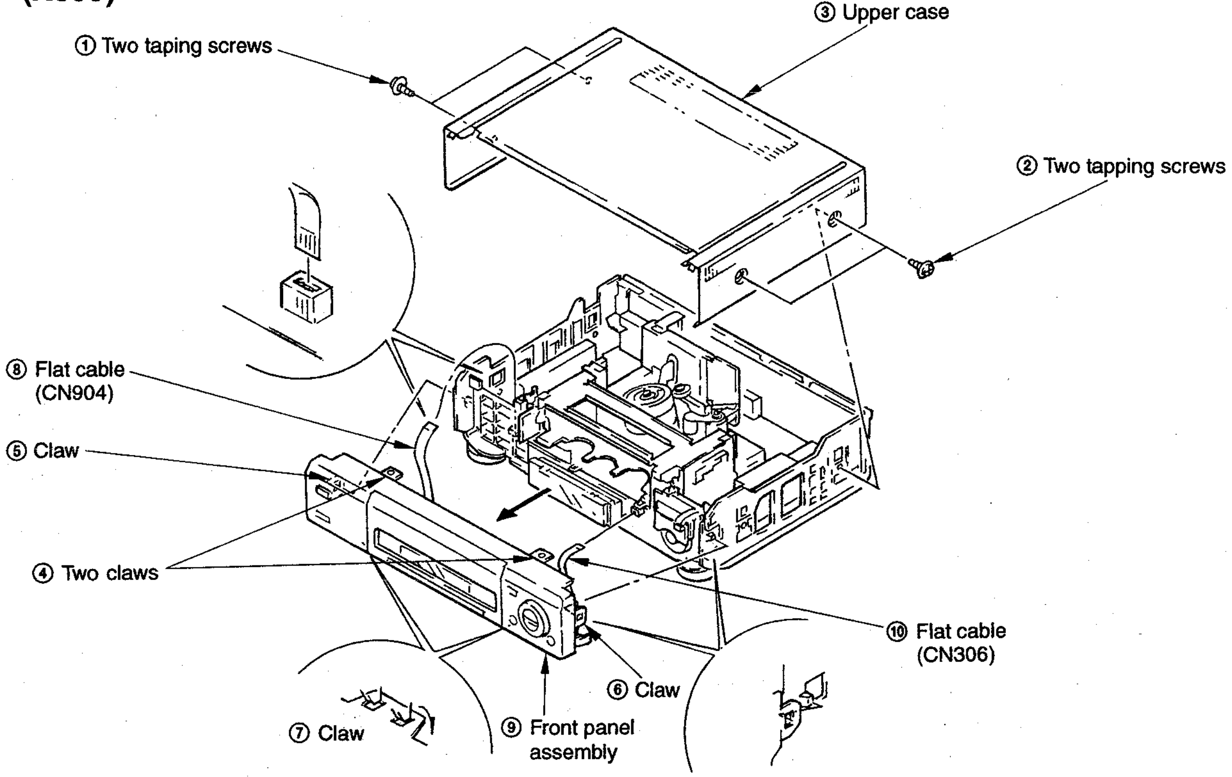
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

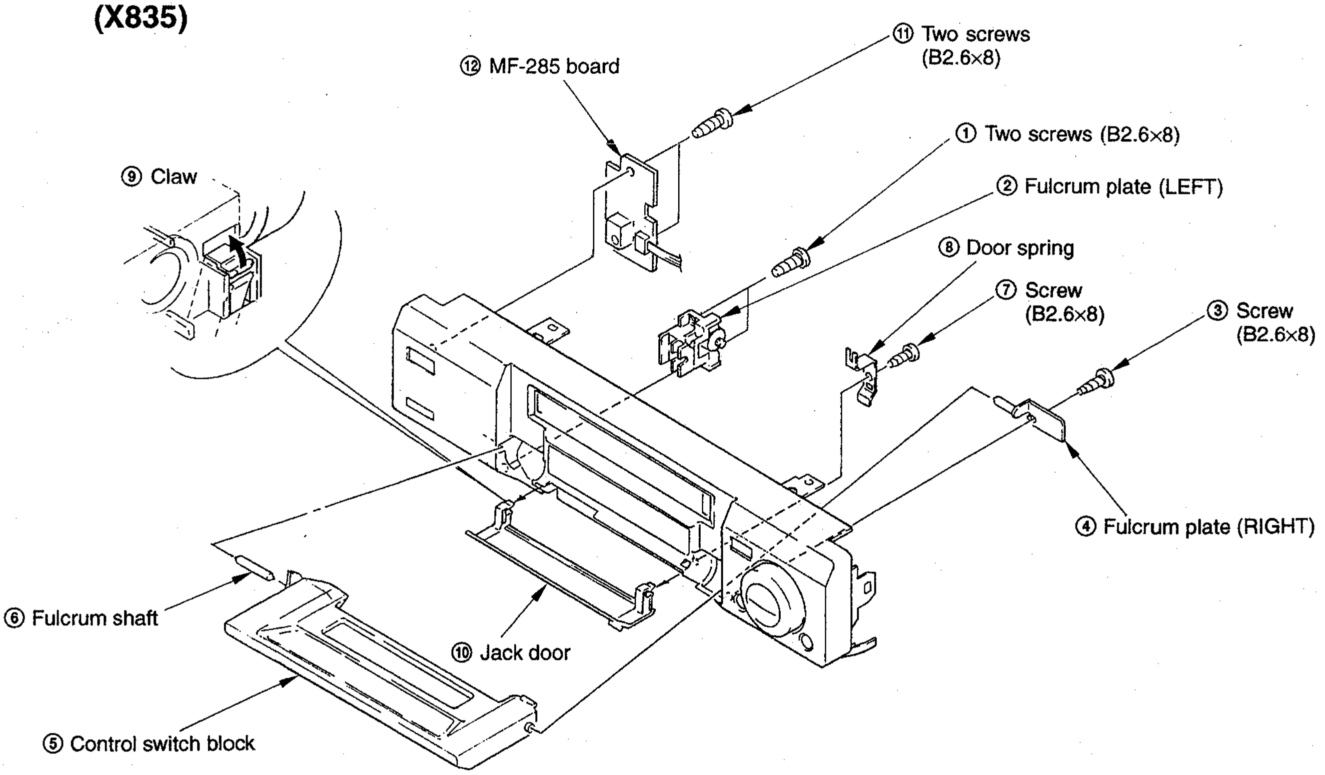
2-1. FRONT PANEL ASSEMBLY, CASE AND MF-285/290 BOARDS (X715/X815/X825)


① Two tapping screws
③ Upper case
⑪ MF-285 board (X825) MF-290 board (X715/X815)
② Two tapping screws
⑩Flat cable (CN201)
⑨ Screw (BVTP 3×12)
⑤ Claw
④ Two claws
⑥ Claw
⑦ Claw
⑧ Front panel assembly

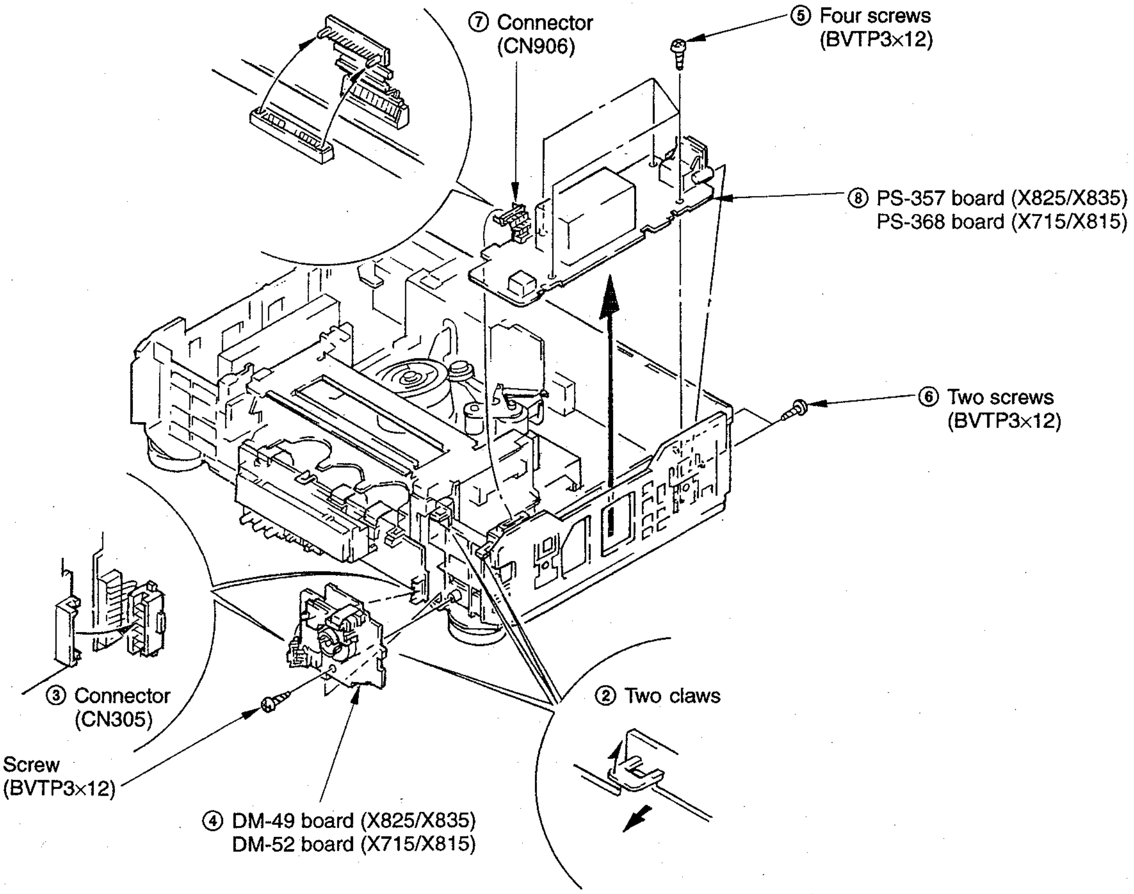
2-2. FRONT PANEL ASSEMBLY AND CASE (X835)


③ Upper case
① Two taping screws
② Two tapping screws
⑧ Flat cable (CN904)
⑤ Claw
④ Two claws
⑩ Flat cable (CN306)
⑥ Claw
⑦ Claw
⑨ Front panel assembly

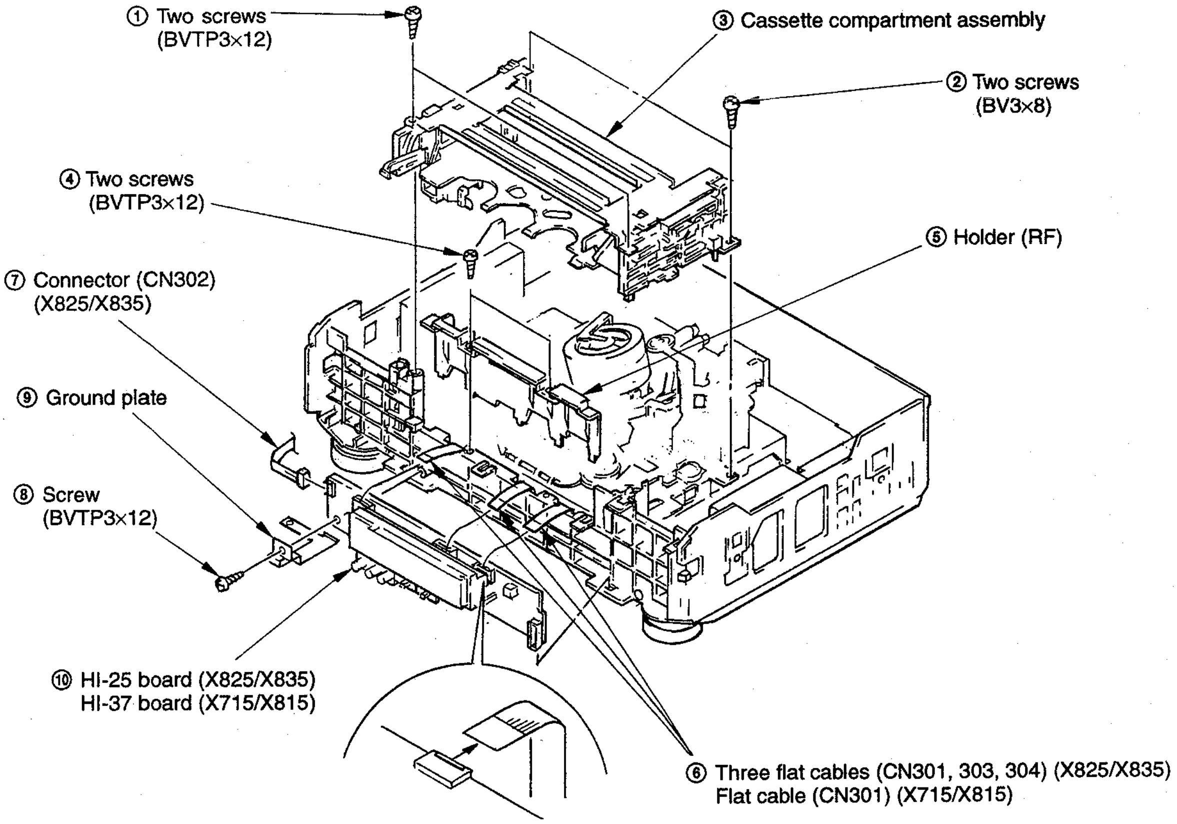
2-3. CONTROL SWITCH BLOCK AND MF-285 BOARD (X835)


⑪ Two screws (B2.6×8)
⑫ MF-285 board
① Two screws (B2.6×8)
⑨ Claw
② Fulcrum plate (LEFT)
⑧ Door spring
⑦ Screw (B2.6×8)
③ Screw (B2.6×8)
④ Fulcrum plate (RIGHT)
⑥ Fulcrum shaft
⑩ Jack door
⑤ Control switch block

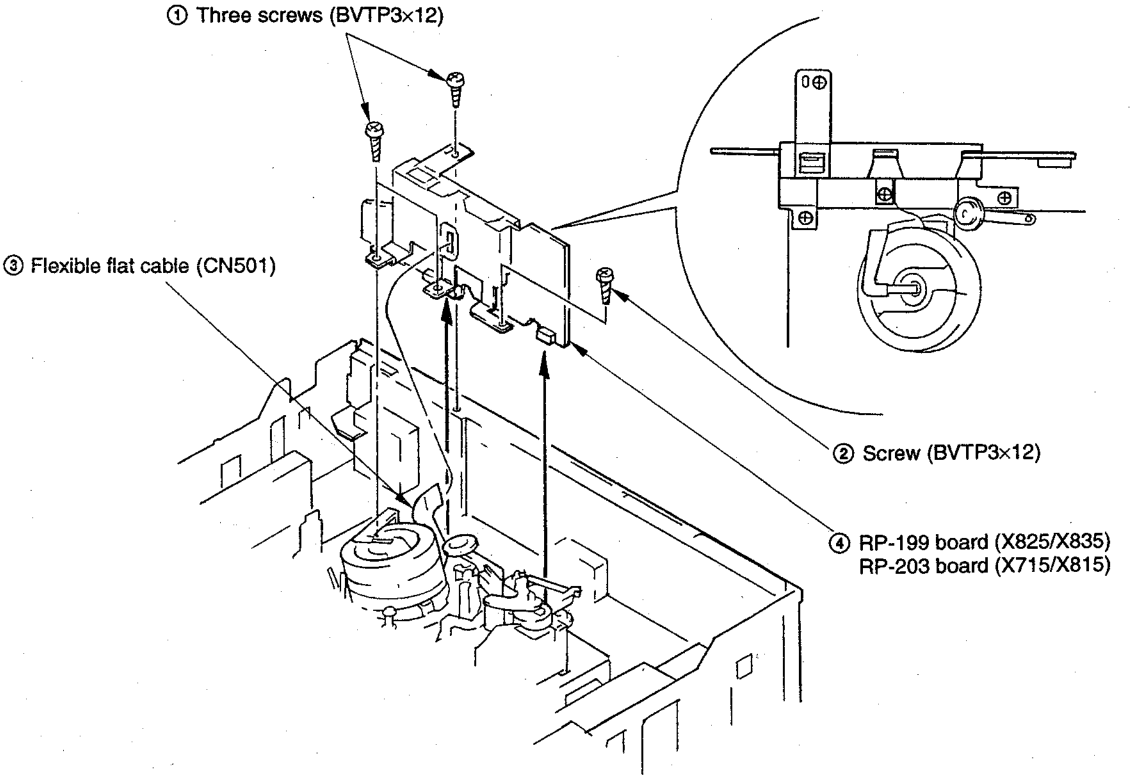
2-4. DM-49/52 BOARD AND PS-357/368 BOARDS


⑦ Connector (CN906)
⑤ Four screws (BVTP3×12)
⑧ PS-357 board (X825/X835)
PS-368 board (X715/X815)
⑥ Two screws (BVTP3×12)
③ Connector (CN305)
② Two claws
① Screw (BVTP3×12)
④ DM-49 board (X825/X835)
DM-52 board (X715/X815)

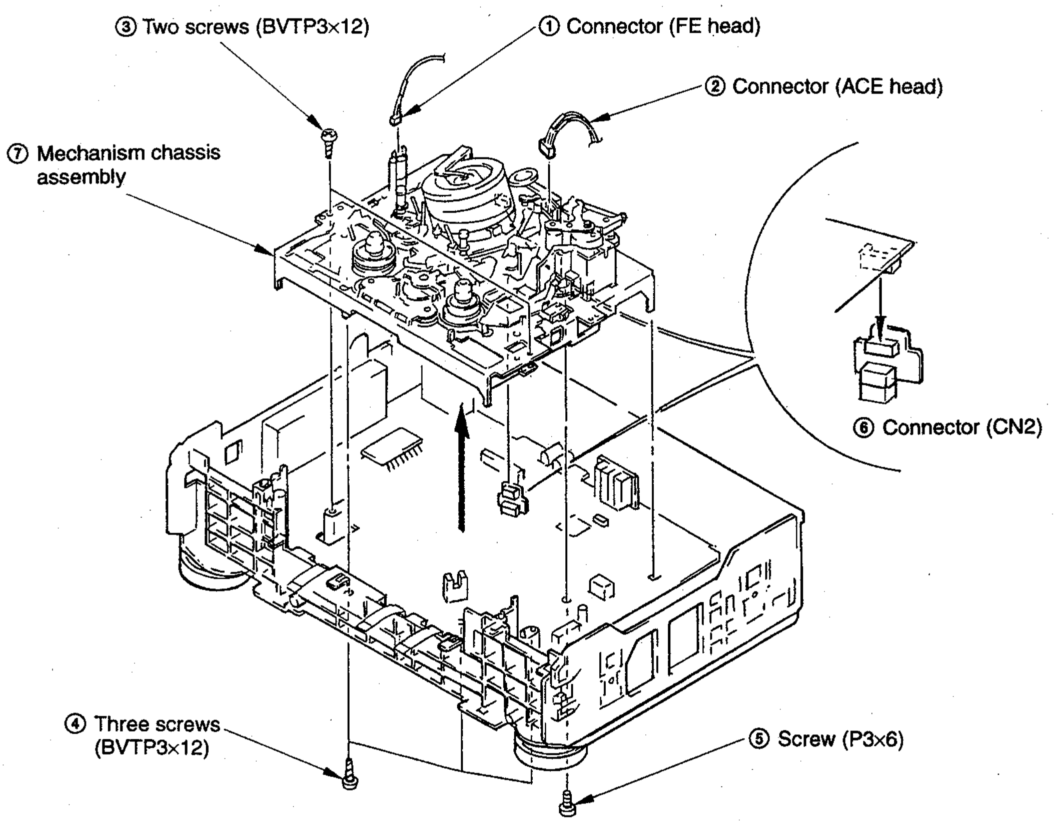
2-5. CASSETTE COMPARTMENT ASSEMBLY AND HI-25/37 BOARDS


① Two screws (BVTP3x12)
③ Cassette compartment assembly
② Two screws (BV3x8)
④ Two screws (BVTP3x12)
⑤ Holder (RF)
⑦ Connector (CN302) (X825/X835)
⑨ Ground plate
⑧ Screw (BVTP3x12)
⑩ HI-25 board (X825/X835) HI-37 board (X715/X815)
⑥ Three flat cables (CN301, 303, 304) (X825/X835) Flat cable (CN301) (X715/X815)

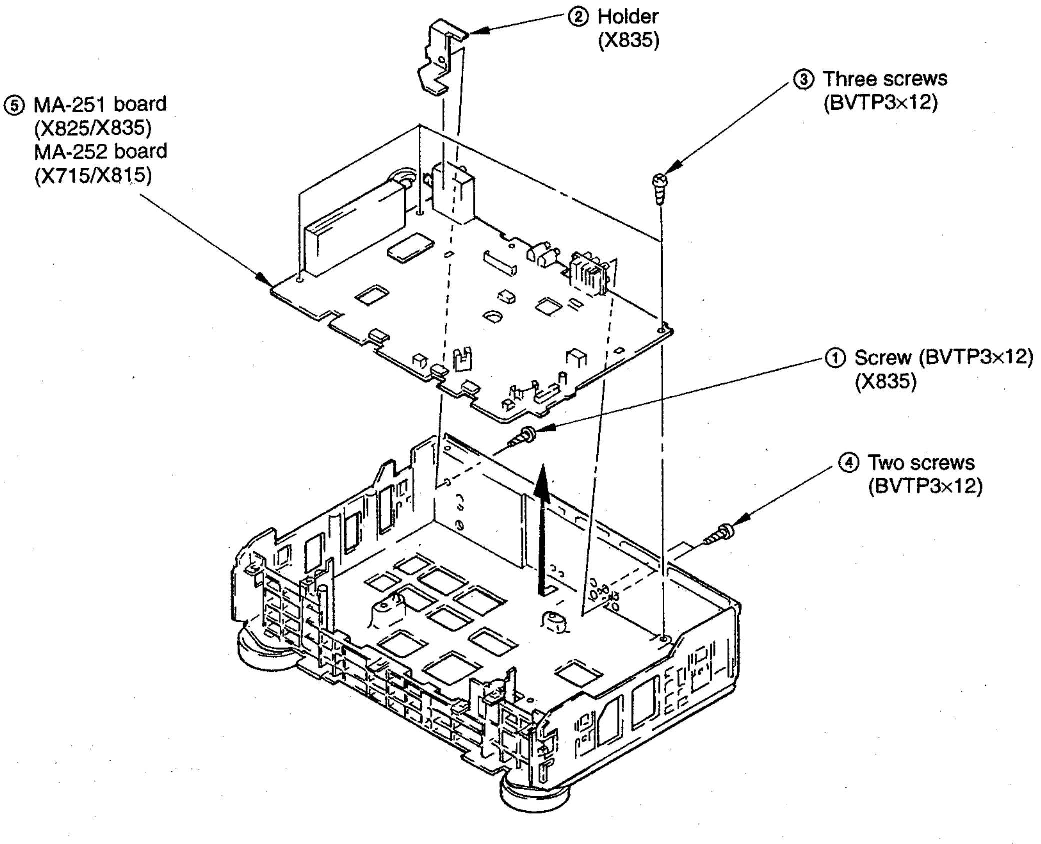
2-6. RP-199/203 BOARDS


① Three screws (BVTP3x12)
③ Flexible flat cable (CN501)
② Screw (BVTP3x12)
④ RP-199 board (X825/X835) RP-203 board (X715/X815)

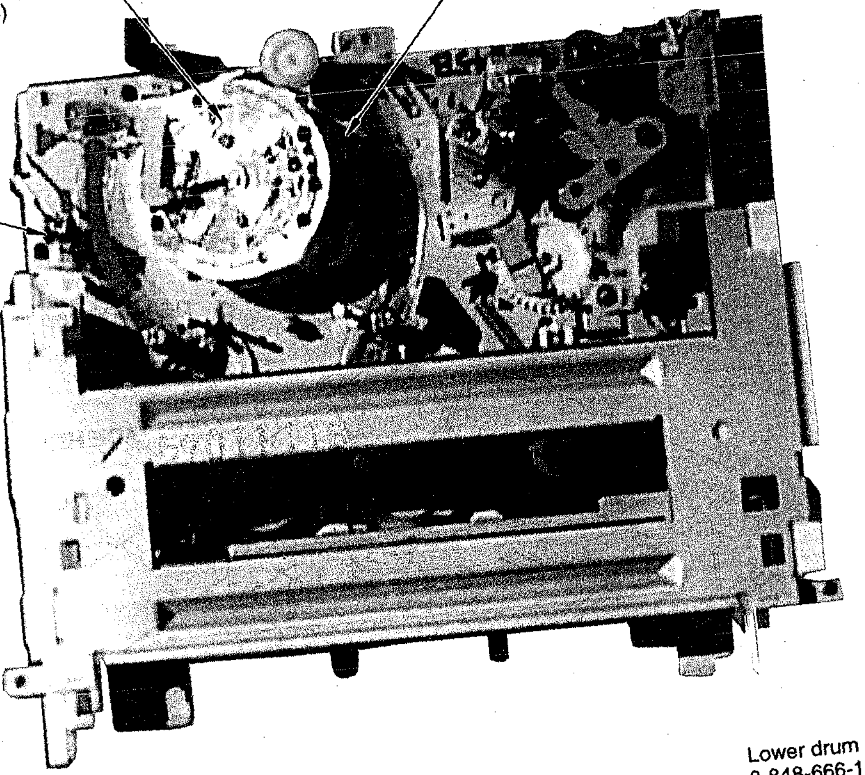
2-7. MECHANISM CHASSIS ASSEMBLY


③ Two screws (BVTP3×12)
① Connector (FE head)
② Connector (ACE head)
⑦ Mechanism chassis assembly
⑥ Connector (CN2)
④ Three screws (BVTP3×12)
⑤ Screw (P3×6)

2-8. MA-251/252 BOARDS


② Holder (X835)
⑤ MA-251 board (X825/X835) MA-252 board (X715/X815)
③ Three screws (BVTP3×12)
① Screw (BVTP3×12) (X835)
④ Two screws (BVTP3×12)

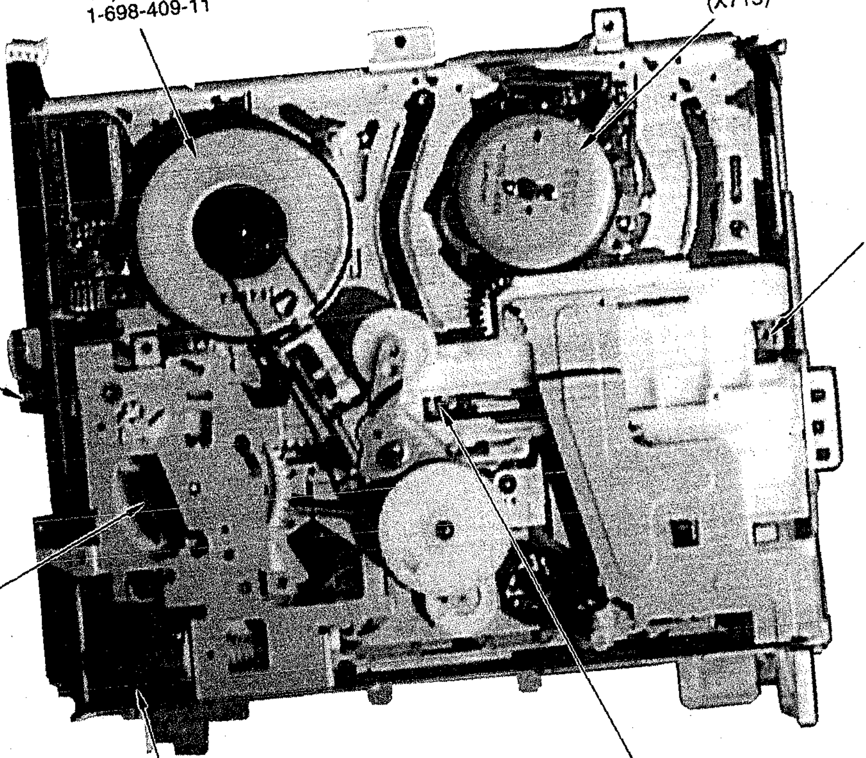
2-9. INTERNAL VIEWS



Rotary upper drum assembly (DZR-67-R)
8-848-623-02
(X815/X825/X835)
Drum assembly (DZH-74B/Q-RP)
8-848-682-11
(X715)

Lower drum assembly (DZR-51/J-RP)
8-848-666-11
(X815/X825/X835)

FE head
1-500-144-11



Lower drum assembly (DZR-51/J-RP)
8-848-666-11
(X815/X825/X835)
Drum assembly (DZH-74B/Q-RP)
8-848-682-11
(X715)

M902
Capstan motor (SCV-0801A/Z-NP)
1-698-409-11

Q262
Tape end sensor
8-729-025-92

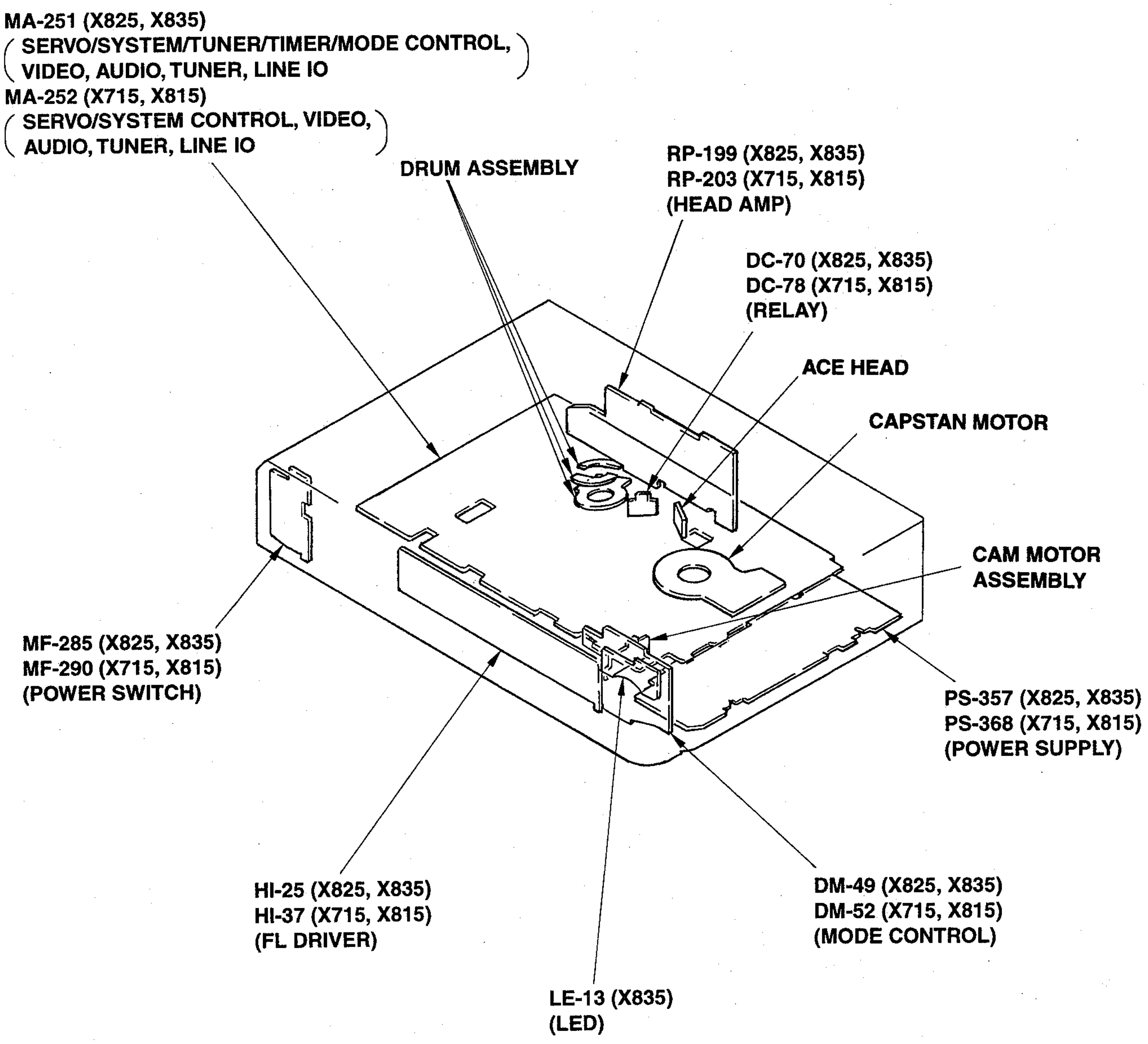
Q261
Tape top sensor
8-729-025-92

Rotary switch
1-762-076-11

D261
Tape top/end LED
8-719-048-26

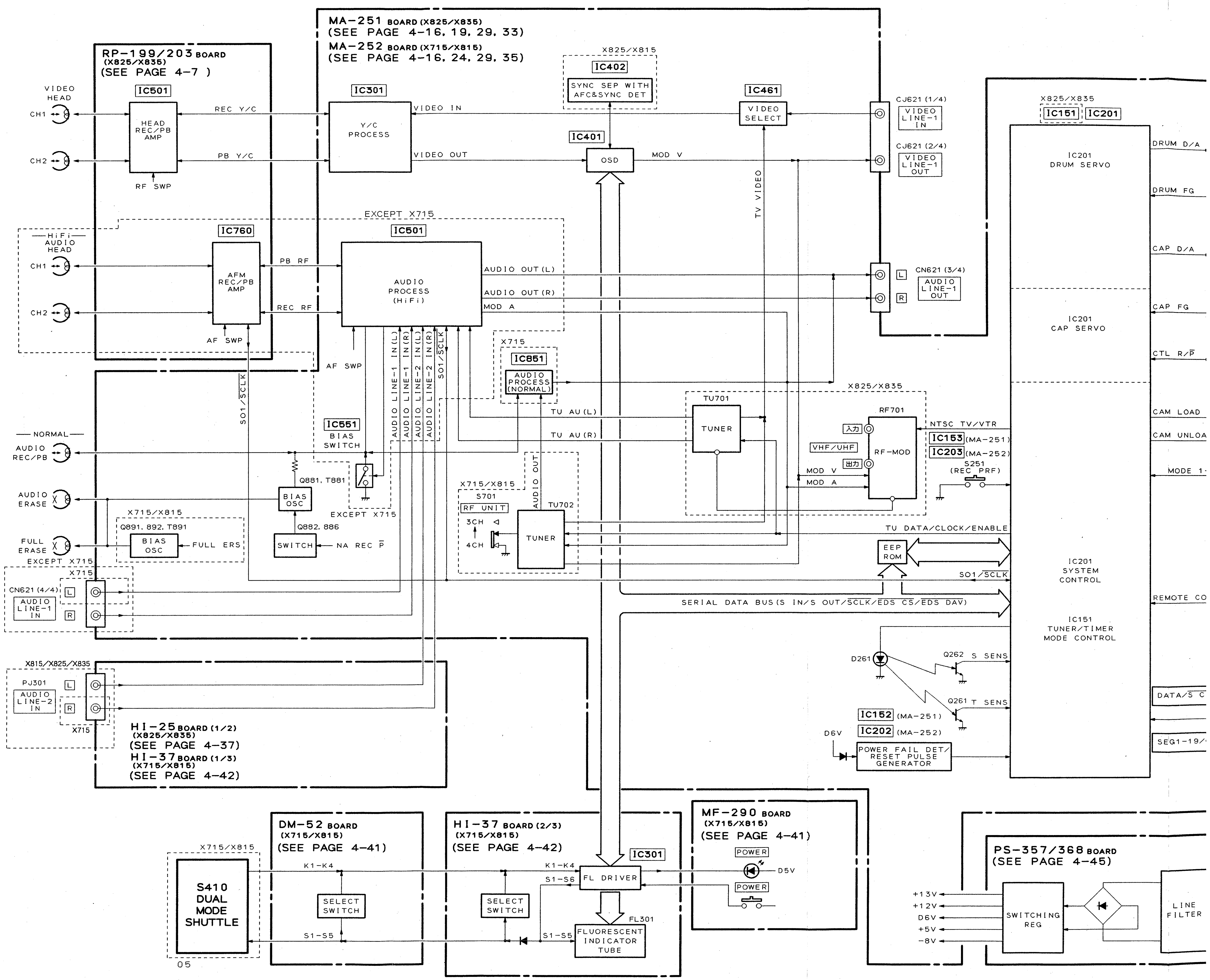
M903
cam motor assembly
X-3943-883-1

2-10. CIRCUIT BOARDS LOCATION

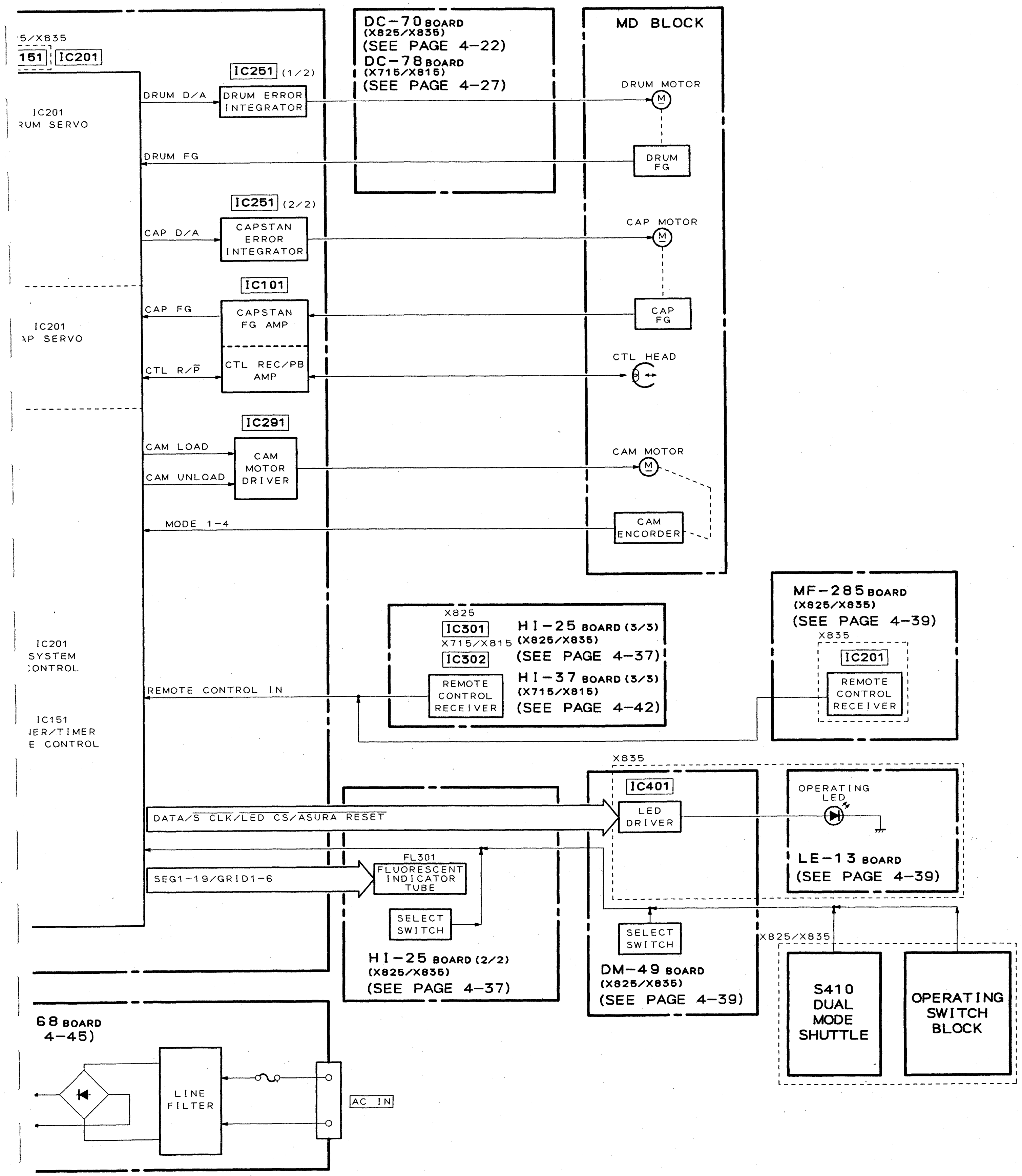

MA-251 (X825, X835)
(SERVO/SYSTEM/TUNER/TIMER/MODE CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
MA-252 (X715, X815)
(SERVO/SYSTEM CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
DRUM ASSEMBLY
RP-199 (X825, X835)
RP-203 (X715, X815)
(HEAD AMP)
DC-70 (X825, X835)
DC-78 (X715, X815)
(RELAY)
ACE HEAD
CAPSTAN MOTOR
CAM MOTOR ASSEMBLY
MF-285 (X825, X835)
MF-290 (X715, X815)
(POWER SWITCH)
PS-357 (X825, X835)
PS-368 (X715, X815)
(POWER SUPPLY)
HI-25 (X825, X835)
HI-37 (X715, X815)
(FL DRIVER)
DM-49 (X825, X835)
DM-52 (X715, X815)
(MODE CONTROL)
LE-13 (X835)
(LED)

SECTION 3
BLOCK DIAGRAMS

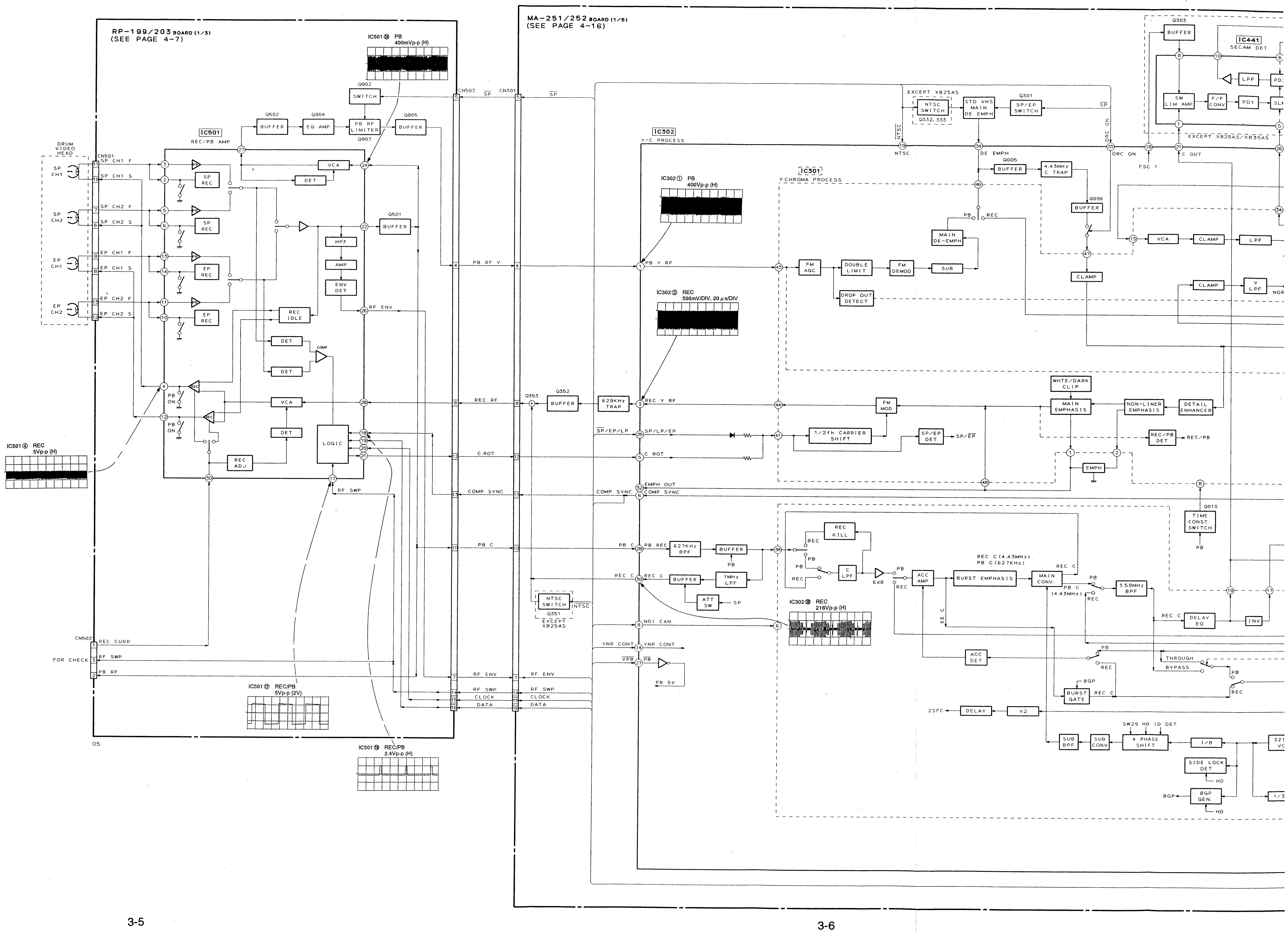
3-1. OVERALL BLOCK DIAGRAM

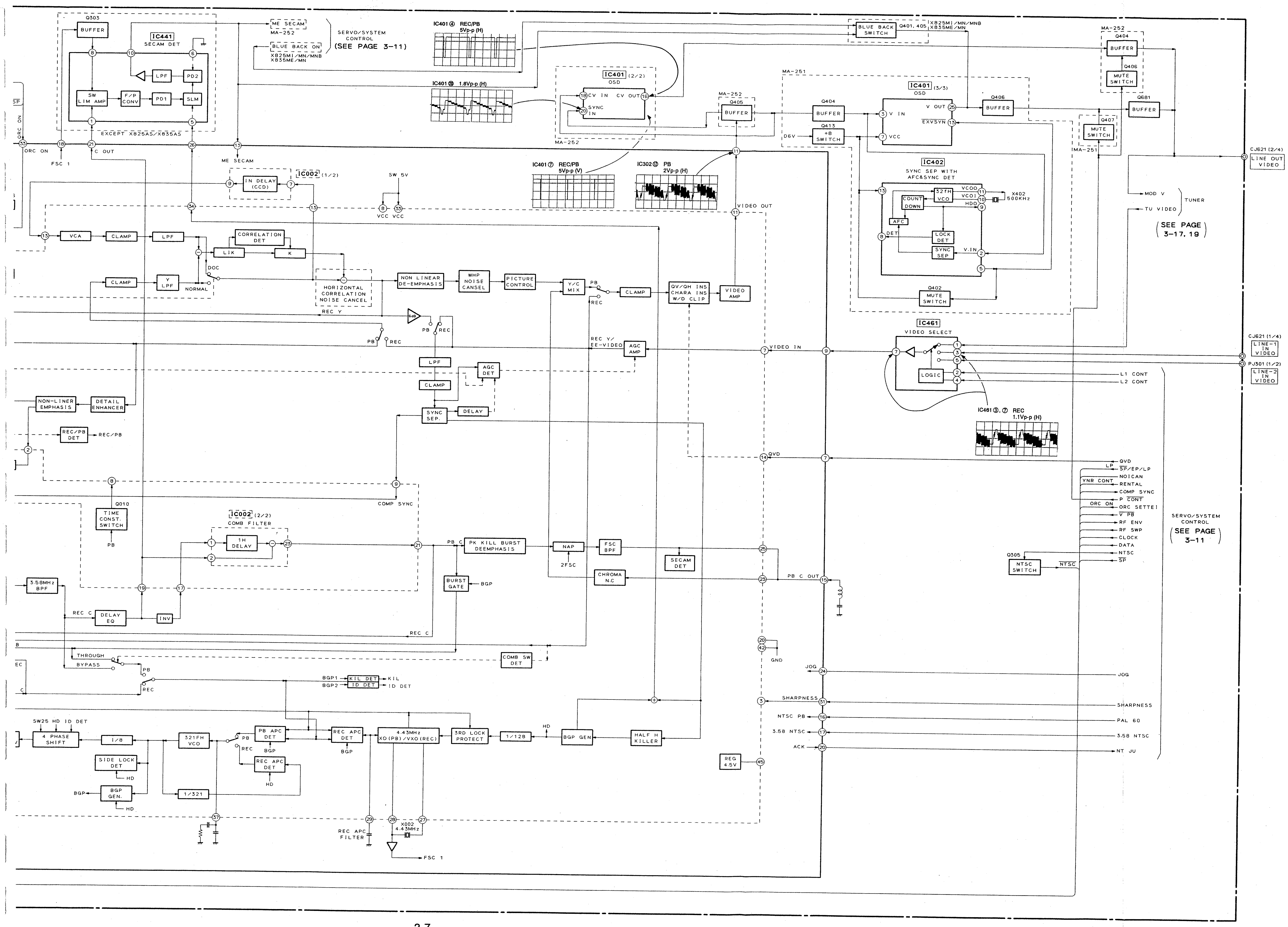


RP-199/203 BOARD (X825/X835)
(SEE PAGE 4-7)
MA-251 BOARD (X825/X835)
(SEE PAGE 4-16, 19, 29, 33)
MA-252 BOARD (X715/X815)
(SEE PAGE 4-16, 24, 29, 35)
VIDEO HEAD
CH1
CH2
IC501
HEAD REC/PB AMP
RF SWP
REC Y/C
PB Y/C
IC301
Y/C PROCESS
VIDEO IN
VIDEO OUT
X825/X815
IC402
SYNC SEP WITH AFC&SYNC DET
IC401
OSD
MOD V
IC461
VIDEO SELECT
TV VIDEO
CJ621 (1/4)
VIDEO LINE-1 IN
CJ621 (2/4)
VIDEO LINE-1 OUT
X825/X835
IC151
IC201
IC201 DRUM SERVO
DRUM D/A
DRUM FG
CAP D/A
CAP FG
IC201 CAP SERVO
CTL R/P̄
CAM LOAD
CAM UNLOA
MODE 1-
EXCEPT X715
HiFi AUDIO HEAD
IC760
AFM REC/PB AMP
PB RF
REC RF
AF SWP
IC501
AUDIO PROCESS (HiFi)
AUDIO OUT(L)
AUDIO OUT(R)
MOD A
CN621 (3/4)
L
R
AUDIO LINE-1 OUT
AUDIO LINE-1 IN(L)
AUDIO LINE-1 IN(R)
AUDIO LINE-2 IN(L)
AUDIO LINE-2 IN(R)
SO1/SCLK
X715
IC851
AUDIO PROCESS (NORMAL)
X825/X835
TU701
TUNER
TU AU(L)
TU AU(R)
RF701
入力
VHF/UHF
出力
RF-MOD
NTSC TV/VTR
IC153 (MA-251)
IC203 (MA-252)
S251 (REC PRF)
MOD V
MOD A
NORMAL
AUDIO REC/PB
IC551
BIAS SWITCH
Q881, T881
BIAS OSC
Q882, 886
SWITCH
NA REC P̄
EXCEPT X715
AUDIO ERASE
X715/X815
Q891, 892, T891
BIAS OSC
FULL ERS
FULL ERASE
EXCEPT X715
X715
CN621 (4/4)
AUDIO LINE-1 IN
X715/X815
S701
RF UNIT
3CH
4CH
AUDIO OUT
TU702
TUNER
TU DATA/CLOCK/ENABLE
EEP ROM
SO1/SCLK
IC201 SYSTEM CONTROL
REMOTE CO
SERIAL DATA BUS(S IN/S OUT/SCLK/EDS CS/EDS DAV)
IC151 TUNER/TIMER MODE CONTROL
D261
Q262 S SENS
Q261 T SENS
IC152 (MA-251)
IC202 (MA-252)
D6V
POWER FAIL DET/ RESET PULSE GENERATOR
DATA/S C
SEG1-19/
X815/X825/X835
PJ301
AUDIO LINE-2 IN
X715
HI-25 BOARD (1/2) (X825/X835)
(SEE PAGE 4-37)
HI-37 BOARD (1/3) (X715/X815)
(SEE PAGE 4-42)
X715/X815
S410 DUAL MODE SHUTTLE
05
DM-52 BOARD (X715/X815)
(SEE PAGE 4-41)
K1-K4
SELECT SWITCH
S1-S5
HI-37 BOARD (2/3) (X715/X815)
(SEE PAGE 4-42)
K1-K4
S1-S6
IC301
FL DRIVER
SELECT SWITCH
S1-S5
FL301
FLUORESCENT INDICATOR TUBE
MF-290 BOARD (X715/X815)
(SEE PAGE 4-41)
POWER
D5V
POWER
PS-357/368 BOARD
(SEE PAGE 4-45)
+13V
+12V
D6V
+5V
-8V
SWITCHING REG
LINE FILTER

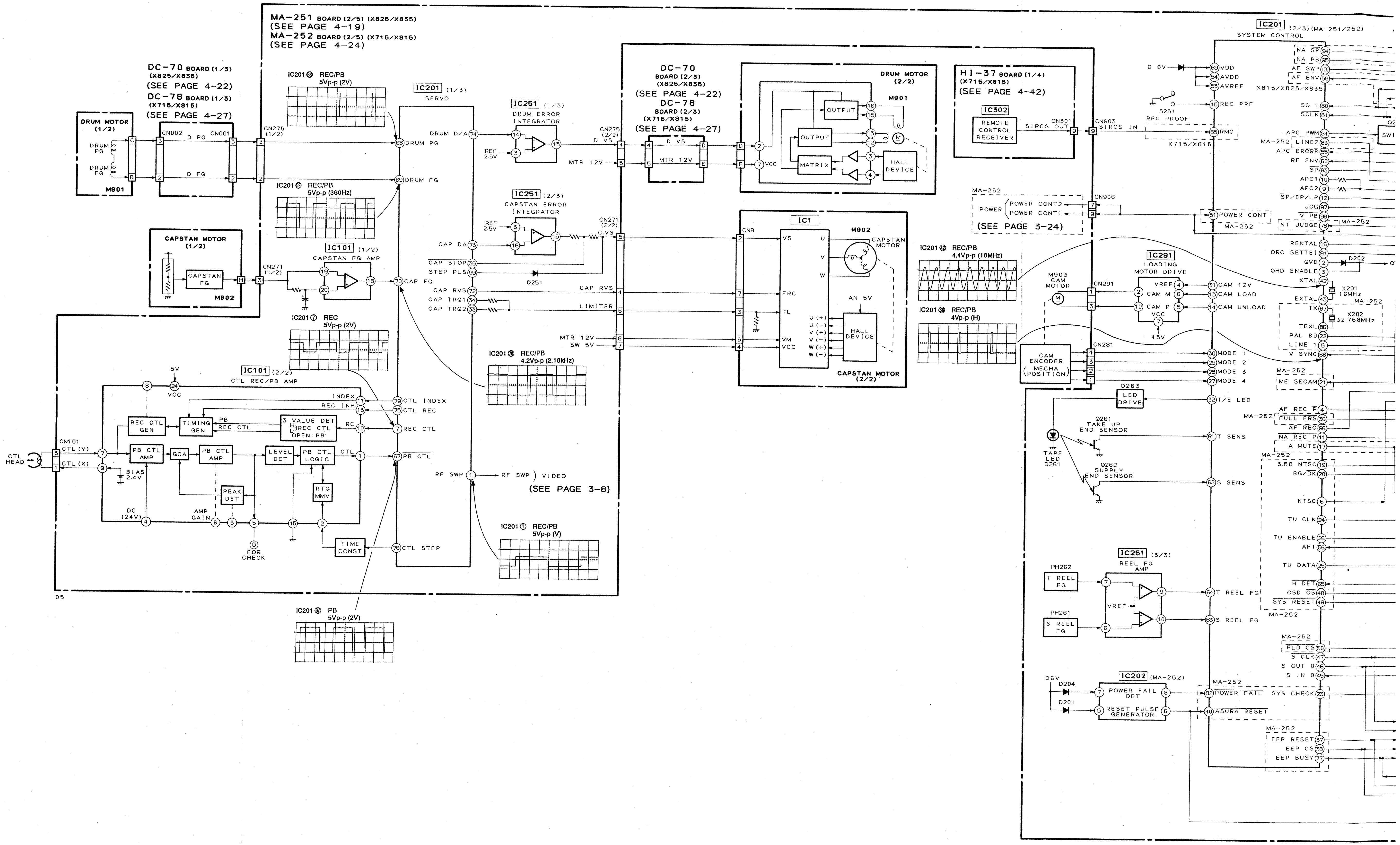

5/X835
151
IC201
IC201
RUM SERVO
IC201
AP SERVO
IC201
SYSTEM
CONTROL
IC151
IER/TIMER
E CONTROL
IC251 (1/2)
DRUM D/A
DRUM ERROR INTEGRATOR
DRUM FG
IC251 (2/2)
CAP D/A
CAPSTAN ERROR INTEGRATOR
IC101
CAP FG
CAPSTAN FG AMP
CTL R/P
CTL REC/PB AMP
IC291
CAM LOAD
CAM UNLOAD
CAM MOTOR DRIVER
MODE 1-4
REMOTE CONTROL IN
DATA/S CLK/LED CS/ASURA RESET
SEG1-19/GRID1-6
DC-70 BOARD (X825/X835) (SEE PAGE 4-22)
DC-78 BOARD (X715/X815) (SEE PAGE 4-27)
MD BLOCK
DRUM MOTOR
M
DRUM FG
CAP MOTOR
M
CAP FG
CTL HEAD
CAM MOTOR
M
CAM ENCORDER
X825
IC301
X715/X815
IC302
REMOTE CONTROL RECEIVER
HI-25 BOARD (3/3) (X825/X835) (SEE PAGE 4-37)
HI-37 BOARD (3/3) (X715/X815) (SEE PAGE 4-42)
MF-285 BOARD (X825/X835) (SEE PAGE 4-39)
X835
IC201
REMOTE CONTROL RECEIVER
FL301
FLUORESCENT INDICATOR TUBE
SELECT SWITCH
HI-25 BOARD (2/2) (X825/X835) (SEE PAGE 4-37)
X835
IC401
LED DRIVER
SELECT SWITCH
DM-49 BOARD (X825/X835) (SEE PAGE 4-39)
OPERATING LED
LE-13 BOARD (SEE PAGE 4-39)
X825/X835
S410 DUAL MODE SHUTTLE
OPERATING SWITCH BLOCK
68 BOARD
4-45)
LINE FILTER
AC IN

3-2. VIDEO BLOCK DIAGRAM

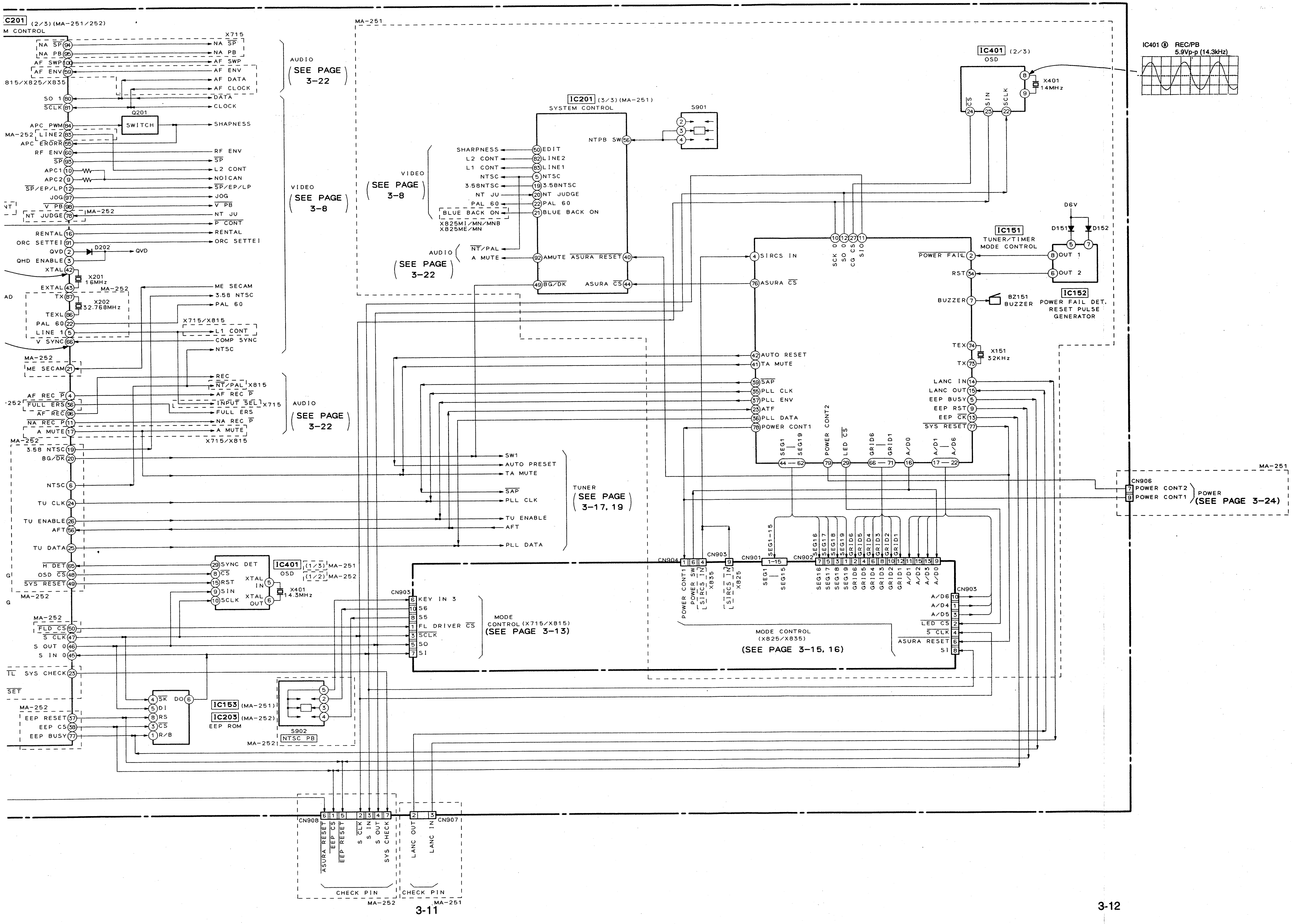

RP-199/203 BOARD (1/3)
(SEE PAGE 4-7)
IC501 ㉔ PB
400mVp-p (H)
Q902
SWITCH
Q502
BUFFER
Q904
EQ AMP
PB RF LIMITER
Q907
Q905
BUFFER
IC501
REC/PB AMP
DRUM VIDEO HEAD
SP CH1
SP CH2
EP CH1
EP CH2
CN501
SP CH1 F
SP CH1 S
SP CH2 F
SP CH2 S
EP CH1 F
EP CH1 S
EP CH2 F
EP CH2 S
SP REC
EP REC
VCA
DET
Q501
BUFFER
HPF
AMP
ENV DET
REC IDLE
COMP
PB ON
REC ADJ
LOGIC
RF ENV
RF SWP
IC501 ④ REC
5Vp-p (H)
CN502
REC CURR
FOR CHECK
PB RF
IC501 ⑰ REC/PB
5Vp-p (2V)
IC501 ⑲ REC/PB
2.4Vp-p (H)
CN503
CN301
SP
PB RF Y
REC RF
C.ROT
COMP SYNC
PB C
CLOCK
DATA
MA-251/252 BOARD (1/5)
(SEE PAGE 4-16)
IC302
Y/C PROCESS
IC302 ① PB
400Vp-p (H)
IC302 ③ REC
500mV/DIV, 20 μs/DIV
Q353
Q352
BUFFER
629KHz TRAP
NTSC SWITCH
Q351
EXCEPT X825AS
INTSC
EXCEPT X825AS
NTSC SWITCH
Q332, 333
STD VHS MAIN DE EMPH
Q301
SP/EP SWITCH
NTSC
DE EMPH
ORC ON
Q005
BUFFER
4.43MHz C TRAP
Q006
BUFFER
IC301
Y/CHROMA PROCESS
MAIN DE-EMPH
FM AGC
DOUBLE LIMIT
FM DEMOD
SUB
DROP OUT DETECT
CLAMP
PB Y RF
REC Y RF
SP/EP/LP
1/2fh CARRIER SHIFT
SP/EP DET
FM MOD
WHTE/DARK CLIP
MAIN EMPHASIS
NON-LINER EMPHASIS
DETAIL ENHANCER
REC/PB DET
EMPH
EMPH OUT
NOI CAN
YNR CONT
VPB
PB 5V
PB REC
627KHz BPF
BUFFER
REC C
1MHz LPF
ATT SW
IC302 ㉚ REC
216Vp-p (H)
REC KILL
C LPF
6dB
ACC AMP
BURST EMPHASIS
REC C (4.43MHz)
PB C (627KHz)
MAIN CONV.
PB C (4.43MHz)
3.58MHz BPF
ACC DET
EE C
BURST GATE
BGP
25FC
DELAY
X2
SUB BPF
SUB CONV
SW25 HD ID DET
4 PHASE SHIFT
1/8
SIDE LOCK DET
BGP GEN.
HD
Q010
TIME CONST. SWITCH
DELAY EQ
INV
THROUGH
BYPASS
Q303
BUFFER
IC441
SECAM DET
LPF
SW LIM AMP
F/P CONV
PD1
EXCEPT X825AS/X835AS
FSC 1
C OUT
VCA
CLAMP
Y LPF
05


Q303
BUFFER
IC441
SECAM DET
SW
LIM AMP
F/P
CONV
PD1
SLM
LPF
PD2
EXCEPT XB25AS/XB35AS
ORC ON
FSC 1
C OUT
ME SECAM
MA-252
BLUE BACK ON
XB25MI/MN/MNB
XB35ME/MN
SERVO/SYSTEM
CONTROL
(SEE PAGE 3-11)
IC401④ REC/PB
5Vp-p (H)
IC401⑳ 1.8Vp-p (H)
IC401 (2/2)
OSD
CV IN
CV OUT
SYNC
IN
MA-252
IC401⑦ REC/PB
5Vp-p (V)
IC302⑫ PB
2Vp-p (H)
BLUE BACK
SWITCH
Q401, 405
XB25MI/MN/MNB
XB35ME/MN
MA-252
Q405
BUFFER
MA-251
Q404
BUFFER
Q413
+8
SWITCH
D6V
IC401 (3/3)
OSD
V IN
VCC
V OUT
EXVSYN
Q406
BUFFER
MA-252
Q404
BUFFER
Q406
MUTE
SWITCH
Q407
MUTE
SWITCH
MA-251
Q681
BUFFER
CJ621 (2/4)
LINE OUT
VIDEO
MOD V
TU VIDEO
TUNER
(SEE PAGE 3-17, 19)
IC402
SYNC SEP WITH
AFC&SYNC DET
COUNT
DOWN
AFC
DET
32fH
VCO
VCOO
VCOI
HDO
X402
500KHz
LOCK
DET
SYNC
SEP
V.IN
Q402
MUTE
SWITCH
IC002 (1/2)
IN DELAY
(CCD)
SW 5V
VCC VCC
VIDEO OUT
VCA
CLAMP
LPF
CORRELATION
DET
LIK
K
DOC
NORMAL
CLAMP
Y
LPF
HORIZONTAL
CORRELATION
NOISE CANCEL
NON LINEAR
DE-EMPHASIS
WHP
NOISE
CANSEL
PICTURE
CONTROL
Y/C
MIX
PB
REC
CLAMP
QV/QH INS
CHARA INS
W/D CLIP
VIDEO
AMP
REC Y
6dB
PB
REC
REC Y/
EE-VIDEO
AGC
AMP
VIDEO IN
IC461
VIDEO SELECT
LOGIC
CJ621 (1/4)
LINE-1
IN
VIDEO
PJ301 (1/2)
LINE-2
IN
VIDEO
L1 CONT
L2 CONT
IC461③, ⑦ REC
1.1Vp-p (H)
LPF
AGC
DET
CLAMP
SYNC
SEP.
DELAY
NON-LINER
EMPHASIS
DETAIL
ENHANCER
REC/PB
DET
REC/PB
QVD
QVD
LP
SP/EP/LP
YNR CONT
NOICAN
RENTAL
COMP SYNC
P CONT
ORC ON
ORC SETTEI
V PB
RF ENV
RF SWP
CLOCK
DATA
NTSC
SP
SERVO/SYSTEM
CONTROL
(SEE PAGE 3-11)
Q305
NTSC
SWITCH
NTSC
Q010
TIME
CONST.
SWITCH
PB
COMP SYNC
IC002 (2/2)
COMB FILTER
1H
DELAY
PB C
PK KILL BURST
DEEMPHASIS
NAP
2FSC
FSC
BPF
SECAM
DET
CHROMA
N.C
PB C OUT
BURST
GATE
BGP
3.58MHz
BPF
REC C
DELAY
EQ
INV
REC C
THROUGH
BYPASS
PB
REC
COMB SW
DET
GND
BGP1
BGP2
KIL DET
ID DET
KIL
ID DET
JOG
JOG
SHARPNESS
SHARPNESS
NTSC PB
PAL 60
3.58 NTSC
3.58 NTSC
ACK
NT JU
SW25 HD ID DET
4 PHASE
SHIFT
1/8
321FH
VCO
PB APC
DET
REC APC
DET
BGP
HD
REC APC
DET
4.43MHz
XO(PB)/VXO(REC)
3RD LOCK
PROTECT
1/128
HD
BGP GEN
HALF H
KILLER
SIDE LOCK
DET
HD
BGP
GEN.
BGP
HD
1/321
REG
4.5V
REC APC
FILTER
X002
4.43MHz
FSC 1

3-3. SERVO SYSTEM CONTROL BLOCK DIAGRAM

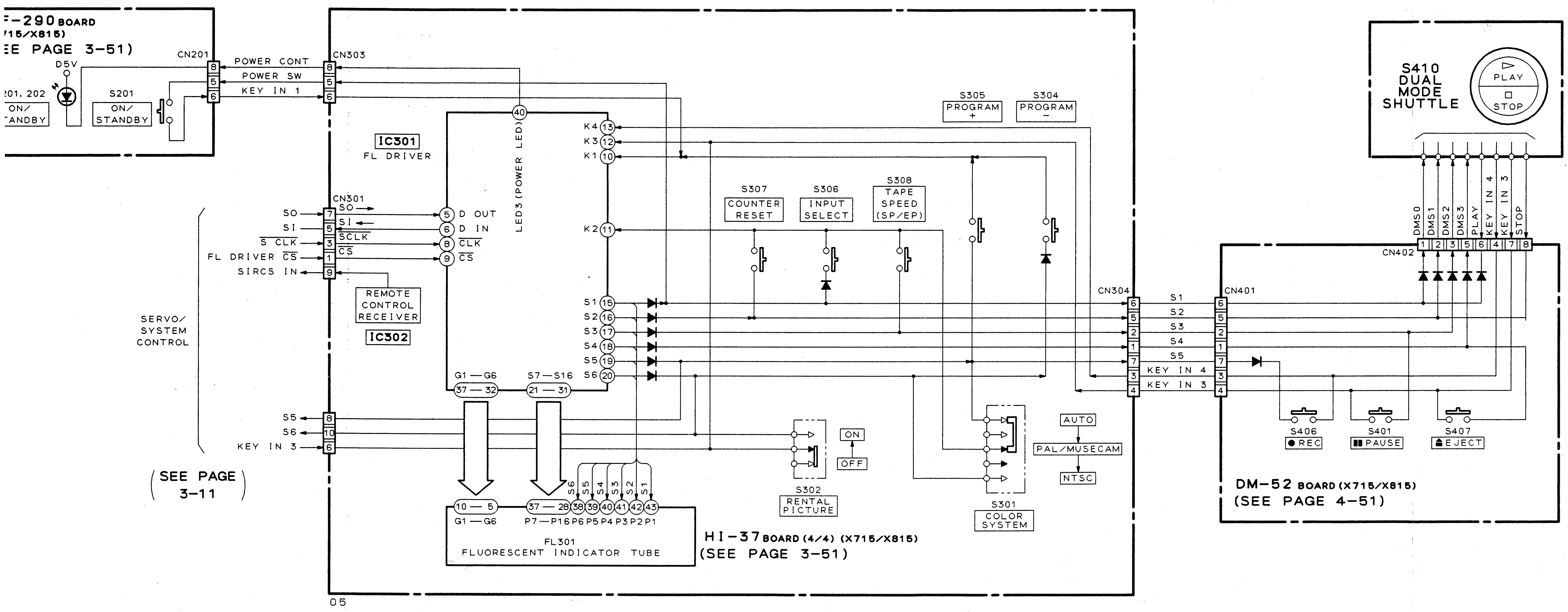


MA-251 BOARD (2/5) (X825/X835)
(SEE PAGE 4-19)
MA-252 BOARD (2/5) (X715/X815)
(SEE PAGE 4-24)
DC-70 BOARD (1/3)
(X825/X835)
(SEE PAGE 4-22)
DC-78 BOARD (1/3)
(X715/X815)
(SEE PAGE 4-27)
DRUM MOTOR (1/2)
DRUM PG
DRUM FG
M901
CN002
CN001
D PG
D FG
CN275 (1/2)
IC201 ⑱ REC/PB
5Vp-p (2V)
IC201 ⑲ REC/PB
5Vp-p (360Hz)
IC201 (1/3)
SERVO
DRUM D/A (74)
(68) DRUM PG
(69) DRUM FG
IC251 (1/3)
DRUM ERROR INTEGRATOR
REF 2.5V
IC251 (2/3)
CAPSTAN ERROR INTEGRATOR
CAPSTAN MOTOR (1/2)
CAPSTAN FG
M902
CN271 (1/2)
IC101 (1/2)
CAPSTAN FG AMP
CAP DA (73)
CAP STOP (35)
STEP PLS (99)
D251
(70) CAP FG
CAP RVS (72)
CAP TRQ1 (34)
CAP TRQ2 (33)
CAP RVS
LIMITER
MTR 12V
SW 5V
IC201 ⑦ REC
5Vp-p (2V)
IC201 ⑳ REC/PB
4.2Vp-p (2.16kHz)
IC101 (2/2)
CTL REC/PB AMP
5V
VCC
INDEX
REC INH
(79) CTL INDEX
(75) CTL REC
REC CTL GEN
TIMING GEN
PB
REC CTL
3 VALUE DET
H REC CTL
L
OPEN PB
RC
(7) REC CTL
CN101
CTL (Y)
CTL (X)
CTL HEAD
PB CTL AMP
GCA
PB CTL AMP
LEVEL DET
PB CTL LOGIC
CTL
(67) PB CTL
BIAS 2.4V
PEAK DET
RTG MMV
DC (24V)
AMP GAIN
FOR CHECK
TIME CONST
(76) CTL STEP
RF SWP
RF SWP
VIDEO
(SEE PAGE 3-8)
IC201 ① REC/PB
5Vp-p (V)
IC201 ⑰ PB
5Vp-p (2V)
05
CN275 (2/2)
D VS
MTR 12V
CN271 (2/2)
C.VS
DC-70 BOARD (2/3)
(X825/X835)
(SEE PAGE 4-22)
DC-78 BOARD (2/3)
(X715/X815)
(SEE PAGE 4-27)
D VS
MTR 12V
DRUM MOTOR (2/2)
M901
OUTPUT
OUTPUT
MATRIX
HALL DEVICE
VCC
IC1
CNB
VS
FRC
TL
VM
VCC
U
V
W
U (+)
U (-)
V (+)
V (-)
W (+)
W (-)
M902
CAPSTAN MOTOR
AN 5V
HALL DEVICE
CAPSTAN MOTOR (2/2)
HI-37 BOARD (1/4)
(X715/X815)
(SEE PAGE 4-42)
IC302
REMOTE CONTROL RECEIVER
CN301
SIRCS OUT
CN903
SIRCS IN
MA-252
POWER
POWER CONT2
POWER CONT1
(SEE PAGE 3-24)
CN906
IC201 ④ REC/PB
4.4Vp-p (16MHz)
IC201 ⑥ REC/PB
4Vp-p (H)
M903
CAM MOTOR
CN291
IC291
LOADING MOTOR DRIVE
VREF
CAM M
CAM P
VCC
13V
CAM ENCODER
(MECHA POSITION)
CN281
Q263
LED DRIVE
Q261
TAKE UP END SENSOR
TAPE LED
D261
Q262
SUPPLY END SENSOR
PH262
T REEL FG
PH261
S REEL FG
IC251 (3/3)
REEL FG AMP
VREF
D6V
D204
D201
IC202 (MA-252)
POWER FAIL DET
RESET PULSE GENERATOR
IC201 (2/3) (MA-251/252)
SYSTEM CONTROL
D 6V
(89) VDD
(54) AVDD
(53) AVREF
S251
REC PROOF
(15) REC PRF
(85) RMC
X715/X815
(51) POWER CONT
MA-252
(31) CAM 12V
(13) CAM LOAD
(14) CAM UNLOAD
(30) MODE 1
(29) MODE 2
(28) MODE 3
(27) MODE 4
(32) T/E LED
(61) T SENS
(62) S SENS
(64) T REEL FG
(63) S REEL FG
MA-252
(82) POWER FAIL
(40) ASURA RESET
NA SP (94)
NA PB (95)
AF SWP (100)
AF ENV (59)
X815/X825/X835
SO 1 (80)
SCLK (81)
APC PWM (84)
MA-252 LINE2 (83)
APC ERORR (55)
RF ENV (60)
SP (93)
APC1 (10)
APC2 (9)
SP/EP/LP (12)
JOG (97)
V PB (98)
NT JUDGE (78)
MA-252
RENTAL (16)
ORC SETTEI (91)
QVD (2)
QHD ENABLE (3)
D202
XTAL (42)
X201 16MHz
EXTAL (43)
MA-252
TX (87)
X202 32.768MHz
TEXL (86)
PAL 60 (22)
LINE 1 (5)
V SYNC (66)
MA-252
ME SECAM (21)
AF REC P (4)
MA-252 FULL ERS (36)
AF REC (96)
NA REC P (11)
A MUTE (17)
MA-252
3.58 NTSC (19)
BG/DK (20)
NTSC (6)
TU CLK (24)
TU ENABLE (26)
AFT (56)
TU DATA (25)
H DET (65)
OSD CS (48)
SYS RESET (49)
MA-252
MA-252
FLD CS (50)
S CLK (47)
S OUT O (46)
S IN O (45)
SYS CHECK (23)
MA-252
EEP RESET (57)
EEP CS (58)
EEP BUSY (77)
SWI

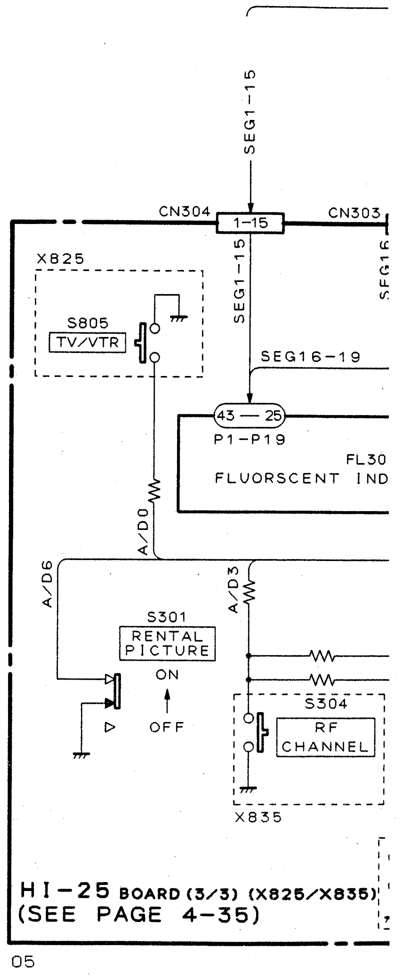

IC201 (2/3) (MA-251/252)
SYSTEM CONTROL
IC201 (3/3) (MA-251)
SYSTEM CONTROL
IC401 (2/3)
OSD
IC401 ⑧ REC/PB
5.9Vp-p (14.3kHz)
X401
14MHz
S901
NTPB SW
IC151
TUNER/TIMER
MODE CONTROL
IC152
POWER FAIL DET.
RESET PULSE
GENERATOR
BZ151
BUZZER
X151
32KHz
D6V
D151
D152
AUDIO
(SEE PAGE 3-22)
VIDEO
(SEE PAGE 3-8)
TUNER
(SEE PAGE 3-17, 19)
POWER
(SEE PAGE 3-24)
MODE CONTROL (X715/X815)
(SEE PAGE 3-13)
MODE CONTROL
(X825/X835)
(SEE PAGE 3-15, 16)
IC401 (1/3) MA-251
(1/2) MA-252
OSD
X401
14.3MHz
IC153 (MA-251)
IC203 (MA-252)
EEP ROM
S902
NTSC PB
Q201
SWITCH
X201
16MHz
X202
32.768MHz
D202
CN903
CN904
CN901
CN902
CN905
CN906
CN907
CN908
CHECK PIN
MA-251
MA-252
X715
X815
X825
X835
SHAPNESS
SHARPNESS
EDIT
LINE2
LINE1
L2 CONT
L1 CONT
NTSC
3.58NTSC
NT JUDGE
PAL 60
BLUE BACK ON
X825MI/MN/MNB
X825ME/MN
NT/PAL
A MUTE
AMUTE
ASURA RESET
BG/DK
ASURA CS
SIRCS IN
SCK 0
SO 0
CG CS
SI 0
POWER FAIL
RST
BUZZER
TEX
TX
AUTO RESET
TA MUTE
SAP
PLL CLK
PLL ENV
ATF
PLL DATA
POWER CONT1
POWER CONT2
LANC IN
LANC OUT
EEP BUSY
EEP RST
EEP CK
SYS RESET
SEG1—SEG19
LED CS
GRID6—GRID1
A/D0
A/D1—A/D6
SW1
AUTO PRESET
TU ENABLE
AFT
NA SP
NA PB
AF SWP
AF ENV
AF DATA
AF CLOCK
DATA
CLOCK
SO 1
SCLK
APC PWM
APC ERORR
RF ENV
SP
APC1
APC2
NOICAN
SP/EP/LP
JOG
V PB
P CONT
RENTAL
ORC SETTEI
QVD
QHD ENABLE
XTAL
EXTAL
TEXL
ME SECAM
3.58 NTSC
PAL 60
LINE 1
V SYNC
COMP SYNC
REC
AF REC P
FULL ERS
AF REC
INPUT SEL
NA REC P
H DET
OSD CS
SYS RESET
SYNC DET
CS
RST
SIN
SCLK
XTAL IN
XTAL OUT
FLD CS
S CLK
S OUT 0
S IN 0
SYS CHECK
SET
EEP RESET
EEP CS
EEP BUSY
SK
DO
DI
RS
R/B
KEY IN 3
S6
S5
FL DRIVER CS
SO
SI
POWER SW
X855
X825
A/D6
A/D4
A/D5
ASURA RESET
S IN
S OUT
LANC OUT
LANC IN

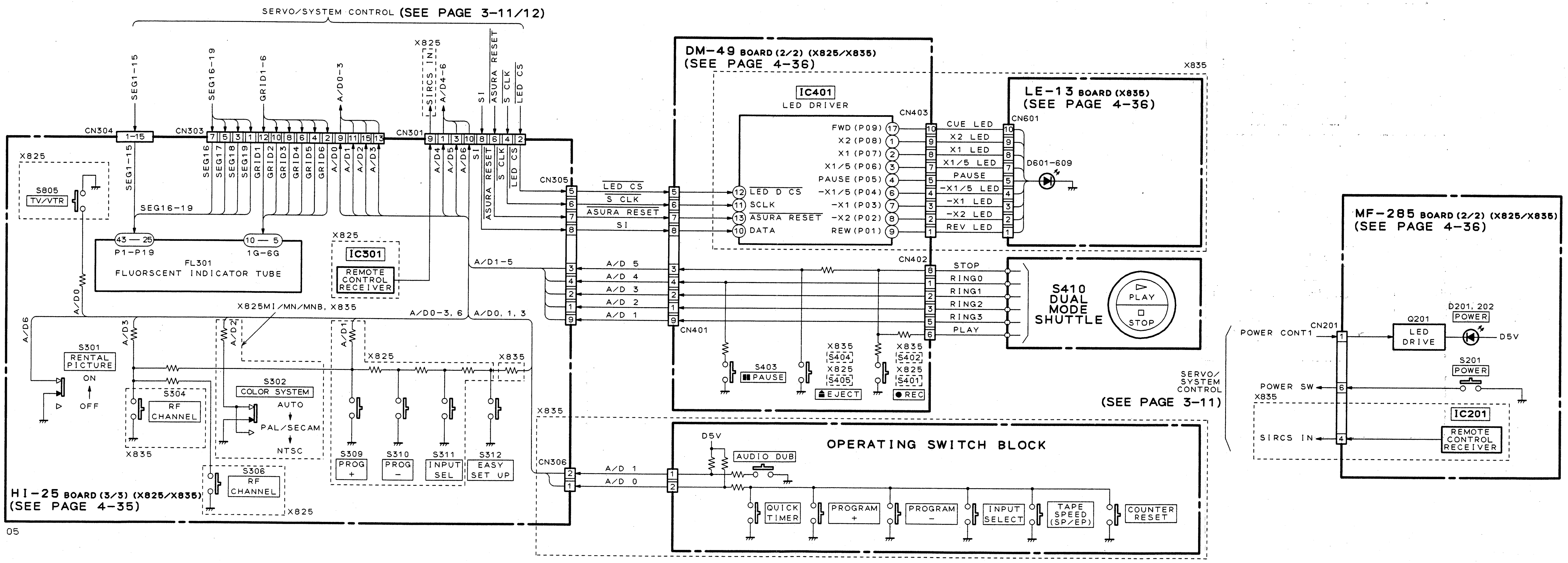
I. MODE CONTROL BLOCK DIAGRAM

—SLV-X715/X815—

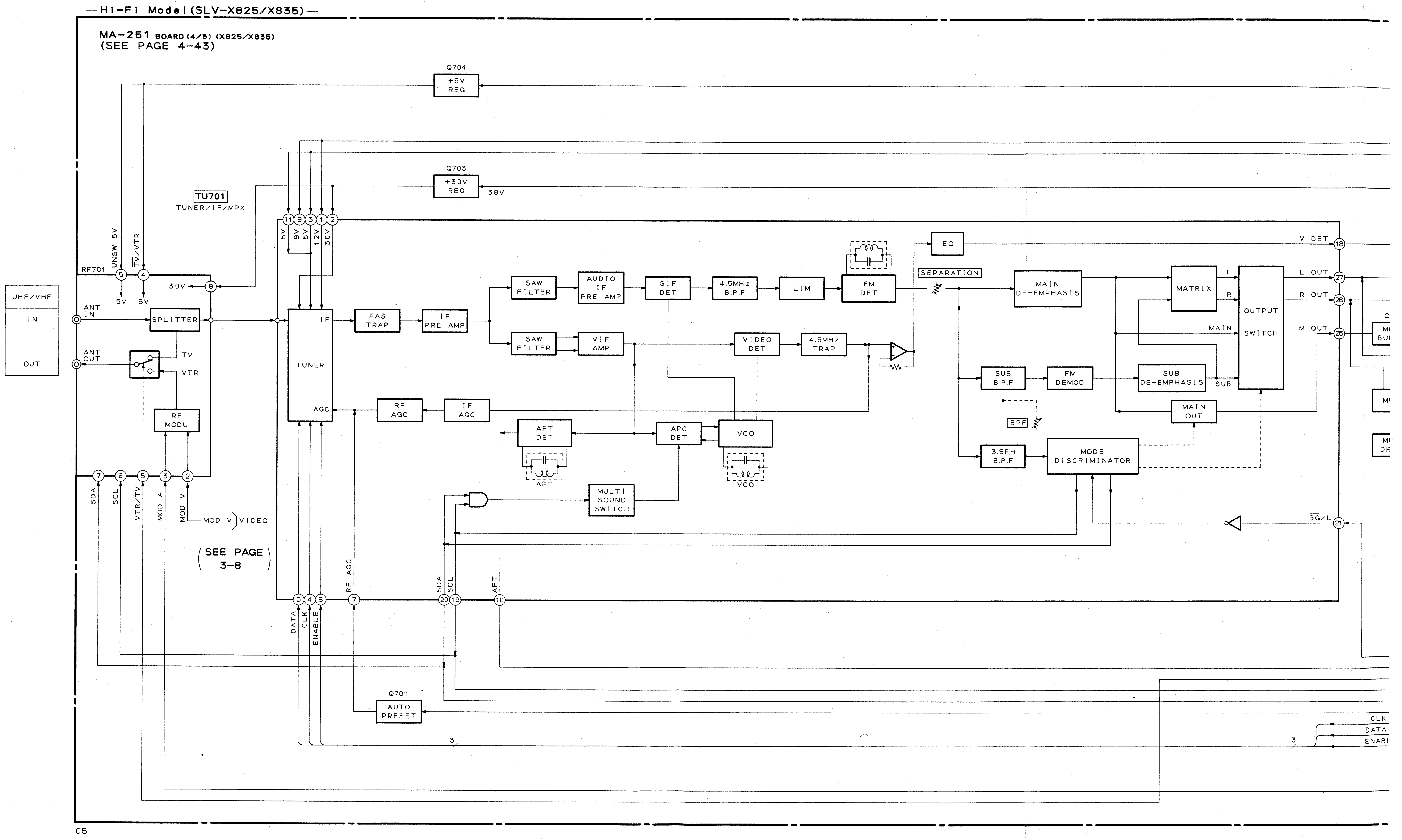

-290 BOARD
'15/X815)
EE PAGE 3-51)
D5V
201, 202
ON/ STANDBY
S201
ON/ STANDBY
CN201
POWER CONT
POWER SW
KEY IN 1
CN303
IC301
FL DRIVER
LED3 (POWER LED)
K4
K3
K1
K2
CN301
SO
SI
S CLK
FL DRIVER CS
SIRCS IN
D OUT
D IN
CLK
CS
REMOTE CONTROL RECEIVER
IC302
SERVO/ SYSTEM CONTROL
S5
S6
KEY IN 3
(SEE PAGE 3-11)
S1
S2
S3
S4
S5
S6
G1 — G6
S7 — S16
37 — 32
21 — 31
10 — 5
37 — 28
G1 — G6
P7 — P16 P6 P5 P4 P3 P2 P1
FL301
FLUORESCENT INDICATOR TUBE
S307
COUNTER RESET
S306
INPUT SELECT
S308
TAPE SPEED (SP/EP)
S305
PROGRAM +
S304
PROGRAM −
S302
RENTAL PICTURE
ON
OFF
S301
COLOR SYSTEM
AUTO
PAL/MUSECAM
NTSC
HI-37 BOARD (4/4) (X715/X815)
(SEE PAGE 3-51)
05
CN304
S1
S2
S3
S4
S5
KEY IN 4
KEY IN 3
CN401
S410
DUAL MODE SHUTTLE
PLAY
STOP
DMS0
DMS1
DMS2
DMS3
PLAY
KEY IN 4
KEY IN 3
STOP
CN402
S406
● REC
S401
❚❚ PAUSE
S407
⏏ EJECT
DM-52 BOARD (X715/X815)
(SEE PAGE 4-51)

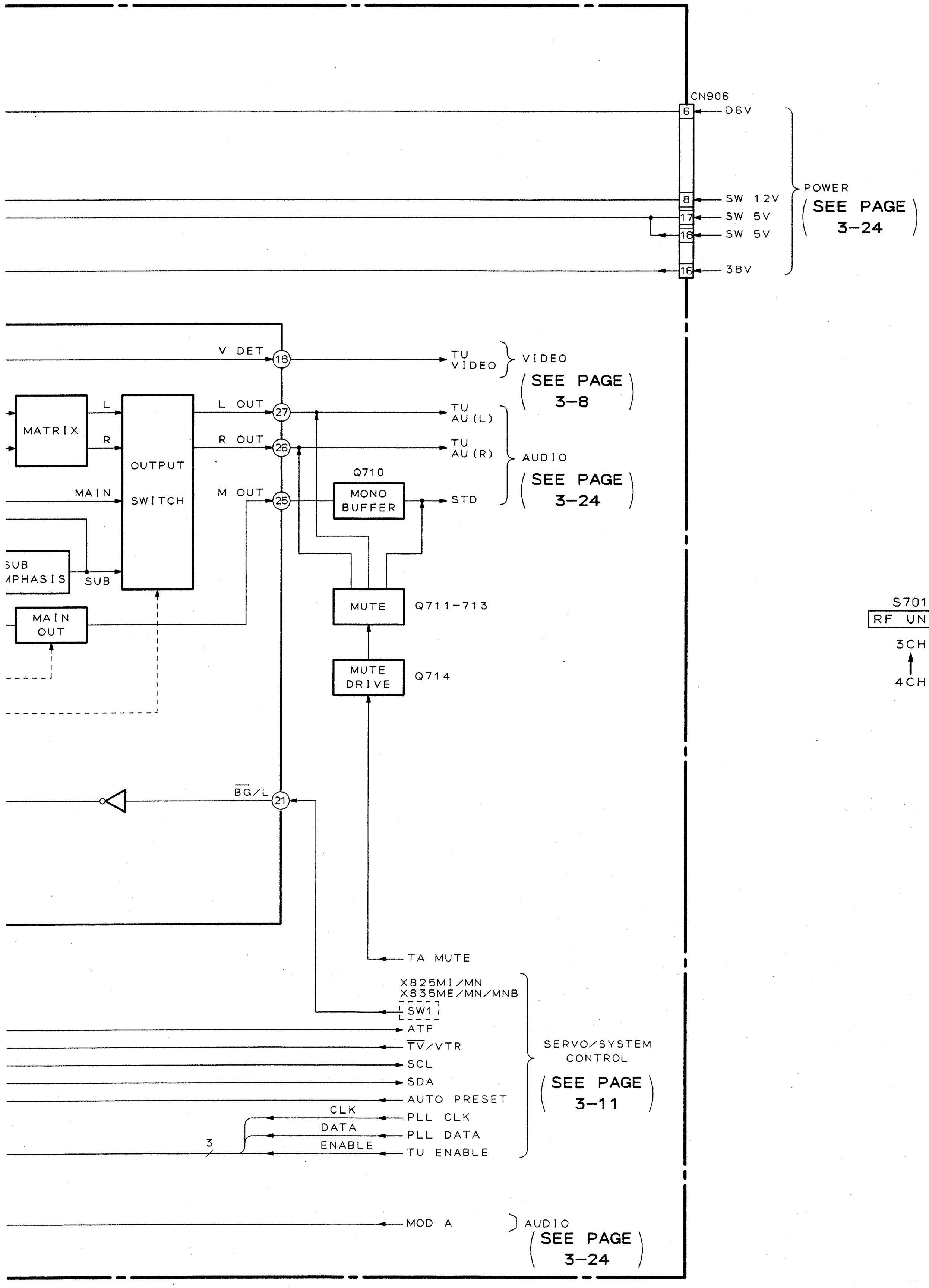
—SLV-X825/X835—

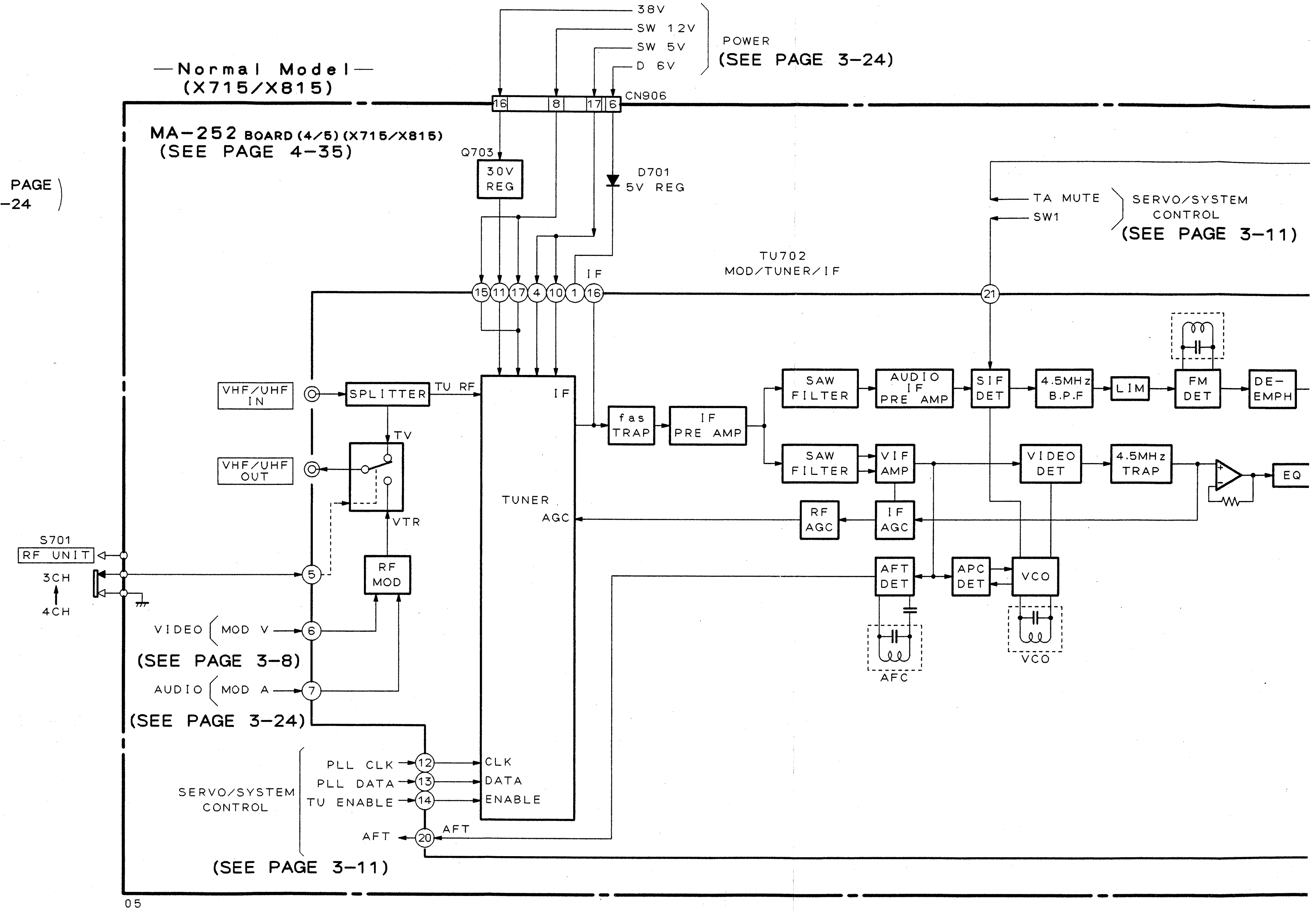

SEG1-15
CN304
1-15
CN303
X825
S805
TV/VTR
SEG1-15
SEG16-19
43 — 25
P1-P19
FL30
FLUORSCENT IND
A/D0
A/D6
A/D3
S301
RENTAL PICTURE
ON
OFF
S304
RF CHANNEL
X835
HI-25 BOARD (3/3) (X825/X835)
(SEE PAGE 4-35)
05

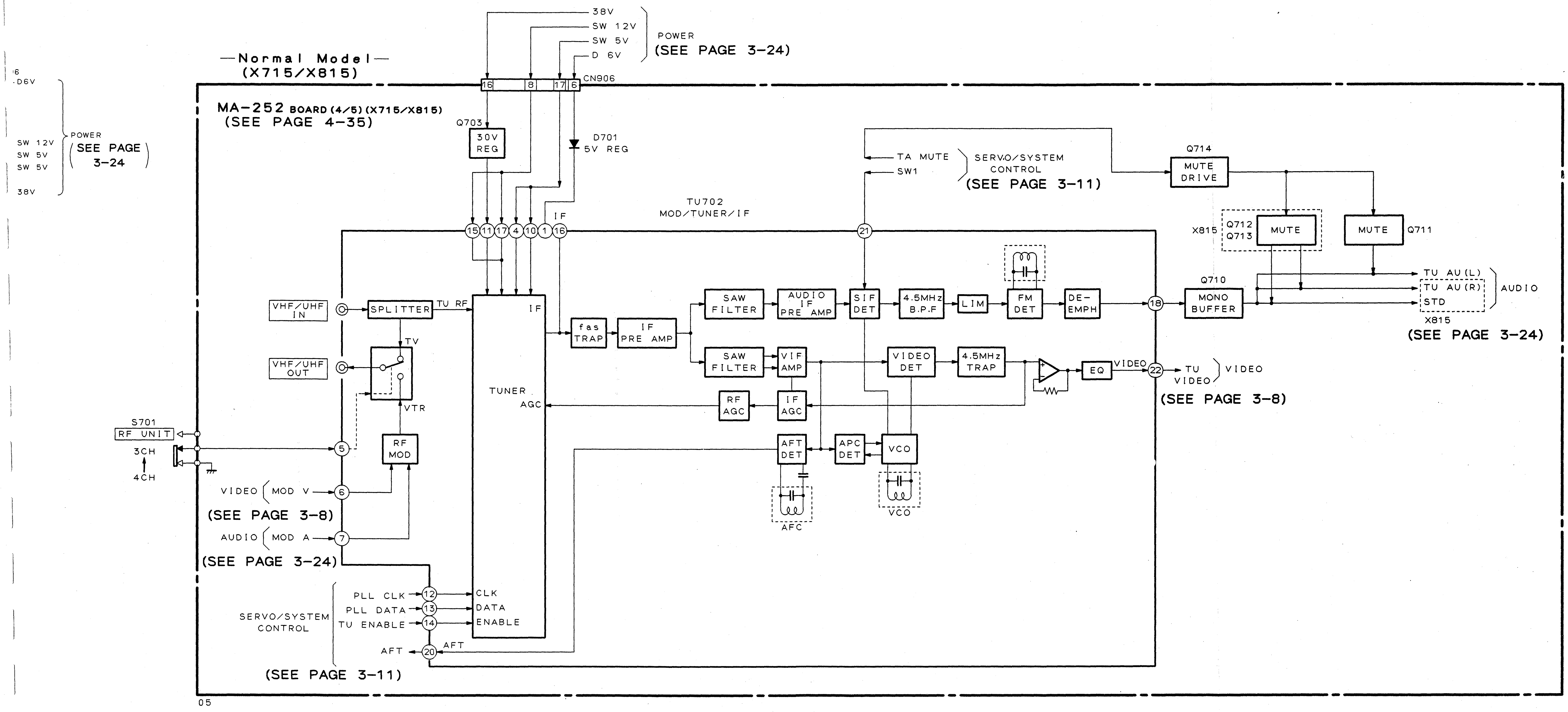

SERVO/SYSTEM CONTROL (SEE PAGE 3-11/12)
SEG1-15
SEG16-19
GRID1-6
A/D0-3
X825
SIRCS IN
A/D4-6
SI
ASURA RESET
S CLK
LED CS
CN304
CN303
CN301
CN305
CN306
X825
S805
TV/VTR
SEG16-19
P1-P19
1G-6G
FL301
FLUORSCENT INDICATOR TUBE
IC301
REMOTE CONTROL RECEIVER
A/D1-5
X825MI/MN/MNB, X835
A/D0-3, 6
A/D0, 1, 3
A/D6
A/D0
A/D3
A/D2
A/D1
S301
RENTAL PICTURE
ON
OFF
S304
RF CHANNEL
X835
S302
COLOR SYSTEM
AUTO
PAL/SECAM
NTSC
S306
RF CHANNEL
X825
S309
PROG +
S310
PROG −
S311
INPUT SEL
S312
EASY SET UP
HI-25 BOARD (3/3) (X825/X835)
(SEE PAGE 4-35)
05
LED CS
S CLK
ASURA RESET
SI
A/D 5
A/D 4
A/D 3
A/D 2
A/D 1
A/D 1
A/D 0
DM-49 BOARD (2/2) (X825/X835)
(SEE PAGE 4-36)
IC401
LED DRIVER
FWD (P09)
X2 (P08)
X1 (P07)
X1/5 (P06)
PAUSE (P05)
-X1/5 (P04)
-X1 (P03)
-X2 (P02)
REW (P01)
LED D CS
SCLK
ASURA RESET
DATA
CN403
CN402
CN401
S403
PAUSE
X835
S404
X825
S405
EJECT
X835
S402
X825
S401
REC
X835
LE-13 BOARD (X835)
(SEE PAGE 4-36)
CN601
CUE LED
X2 LED
X1 LED
X1/5 LED
PAUSE
-X1/5 LED
-X1 LED
-X2 LED
REV LED
D601-609
STOP
RING0
RING1
RING2
RING3
PLAY
S410
DUAL MODE SHUTTLE
PLAY
STOP
X835
D5V
AUDIO DUB
OPERATING SWITCH BLOCK
QUICK TIMER
PROGRAM +
PROGRAM −
INPUT SELECT
TAPE SPEED (SP/EP)
COUNTER RESET
SERVO/SYSTEM CONTROL
(SEE PAGE 3-11)
POWER CONT1
POWER SW
X835
SIRCS IN
CN201
MF-285 BOARD (2/2) (X825/X835)
(SEE PAGE 4-36)
Q201
LED DRIVE
D201, 202
POWER
D5V
S201
POWER
IC201
REMOTE CONTROL RECEIVER

3-5. TUNER BLOCK DIAGRAM

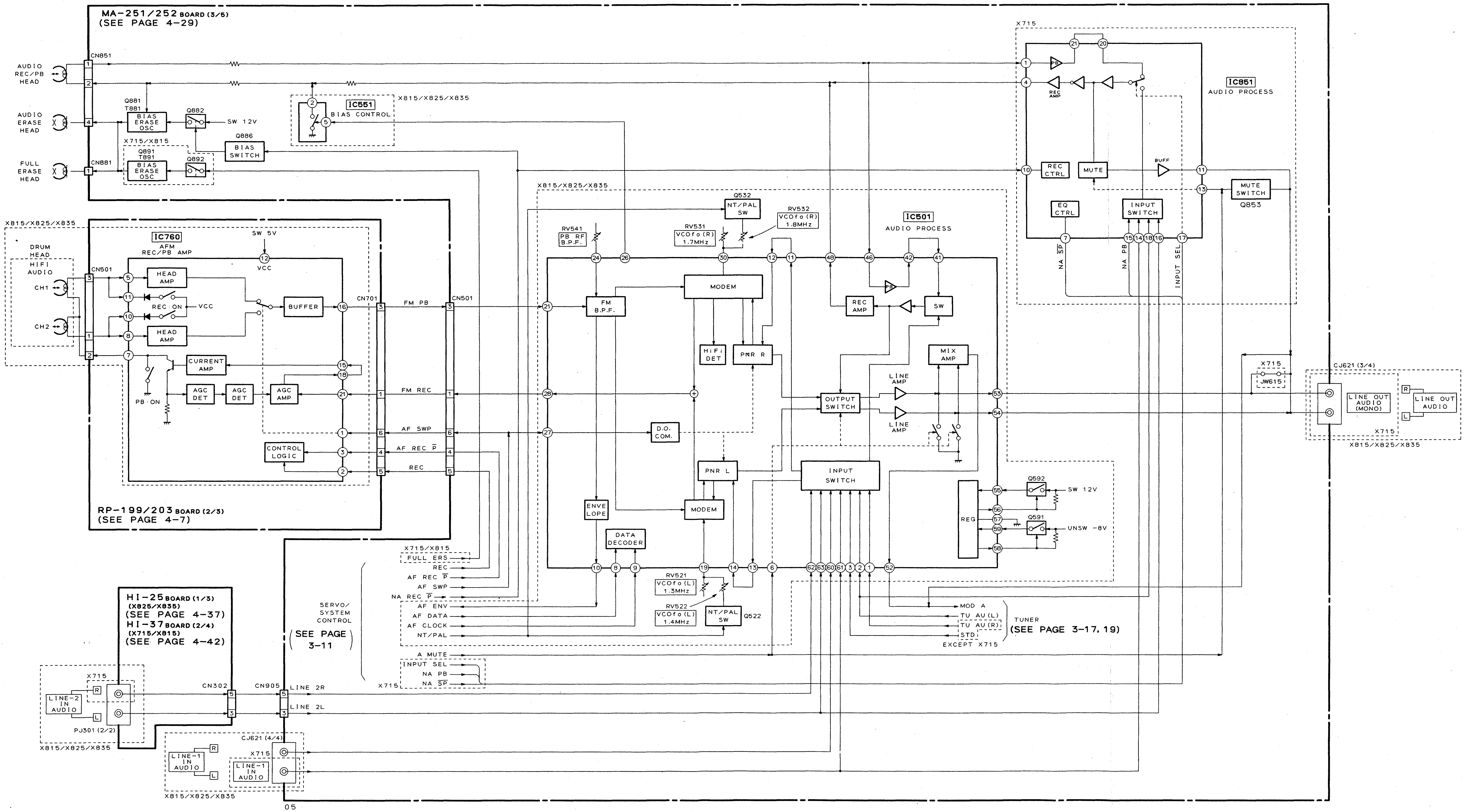

—Hi-Fi Model (SLV-X825/X835)—
MA-251 BOARD (4/5) (X825/X835)
(SEE PAGE 4-43)
Q704
+5V REG
Q703
+30V REG
38V
TU701
TUNER/IF/MPX
11 9 3 1 2
5V 9V 5V 12V 30V
RF701
UNSW 5V
TV/VTR
5 4
5V 5V
30V
9
UHF/VHF
IN
OUT
ANT IN
ANT OUT
SPLITTER
TV
VTR
RF MODU
IF
TUNER
AGC
FAS TRAP
IF PRE AMP
SAW FILTER
AUDIO IF PRE AMP
SIF DET
4.5MHz B.P.F
LIM
FM DET
SAW FILTER
VIF AMP
VIDEO DET
4.5MHz TRAP
EQ
SEPARATION
MAIN DE-EMPHASIS
MATRIX
L
R
OUTPUT SWITCH
MAIN
V DET 18
L OUT 27
R OUT 26
M OUT 25
SUB B.P.F
FM DEMOD
SUB DE-EMPHASIS
SUB
MAIN OUT
BPF
3.5FH B.P.F
MODE DISCRIMINATOR
BG/L 21
RF AGC
IF AGC
AFT DET
AFT
APC DET
VCO
VCO
MULTI SOUND SWITCH
7 6 5 3 2
SDA SCL VTR/TV MOD A MOD V
MOD V } VIDEO
(SEE PAGE 3-8)
5 4 6
DATA CLK ENABLE
RF AGC
7
SDA SCL
20 19
AFT
10
Q701
AUTO PRESET
3
3
CLK
DATA
ENABL
05


CN906
6 D6V
8 SW 12V
17 SW 5V
18 SW 5V
16 38V
POWER
SEE PAGE 3-24
V DET
18
TU VIDEO
VIDEO
SEE PAGE 3-8
MATRIX
L
R
OUTPUT SWITCH
L OUT
27
R OUT
26
TU AU(L)
TU AU(R)
AUDIO
SEE PAGE 3-24
MAIN
M OUT
25
Q710
MONO BUFFER
STD
SUB
SUB EMPHASIS
MAIN OUT
MUTE
Q711-713
MUTE DRIVE
Q714
BG/L
21
TA MUTE
X825MI/MN
X835ME/MN/MNB
SW1
ATF
TV/VTR
SCL
SDA
AUTO PRESET
CLK
PLL CLK
DATA
PLL DATA
3
ENABLE
TU ENABLE
SERVO/SYSTEM CONTROL
SEE PAGE 3-11
MOD A
AUDIO
SEE PAGE 3-24

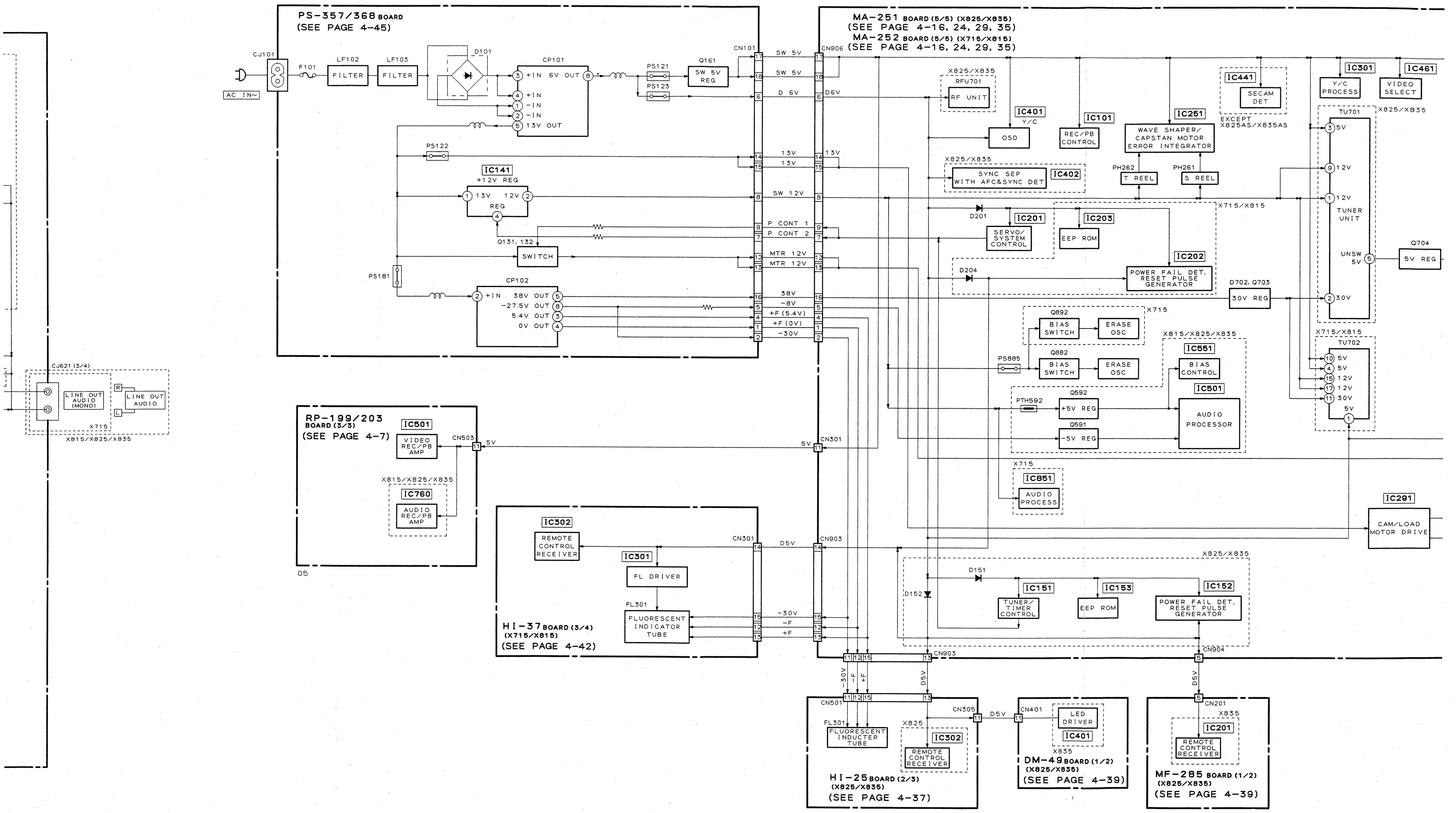

—Normal Model—
(X715/X815)
38V
SW 12V
SW 5V
D 6V
POWER
(SEE PAGE 3-24)
16
8
17
6
CN906
MA-252 BOARD (4/5) (X715/X815)
(SEE PAGE 4-35)
Q703
30V REG
D701
5V REG
TA MUTE
SW1
SERVO/SYSTEM CONTROL
(SEE PAGE 3-11)
TU702
MOD/TUNER/IF
IF
15 11 17 4 10 1 16
21
VHF/UHF IN
SPLITTER
TU RF
IF
fas TRAP
IF PRE AMP
SAW FILTER
AUDIO IF PRE AMP
SIF DET
4.5MHz B.P.F
LIM
FM DET
DE-EMPH
VHF/UHF OUT
TV
VTR
SAW FILTER
VIF AMP
VIDEO DET
4.5MHz TRAP
EQ
TUNER
AGC
RF AGC
IF AGC
S701
RF UNIT
3CH
4CH
5
RF MOD
AFT DET
APC DET
VCO
AFC
VCO
VIDEO
MOD V
6
(SEE PAGE 3-8)
AUDIO
MOD A
7
(SEE PAGE 3-24)
SERVO/SYSTEM CONTROL
PLL CLK
12
CLK
PLL DATA
13
DATA
TU ENABLE
14
ENABLE
AFT
20
AFT
(SEE PAGE 3-11)
05


6
D6V
SW 12V
SW 5V
SW 5V
38V
POWER
(SEE PAGE 3-24)
—Normal Model—
(X715/X815)
38V
SW 12V
SW 5V
D 6V
POWER
(SEE PAGE 3-24)
CN906
16
8
17
6
MA-252 BOARD (4/5) (X715/X815)
(SEE PAGE 4-35)
Q703
30V REG
D701
5V REG
TA MUTE
SW1
SERVO/SYSTEM CONTROL
(SEE PAGE 3-11)
Q714
MUTE DRIVE
TU702
MOD/TUNER/IF
IF
15
11
17
4
10
1
16
21
X815
Q712
Q713
MUTE
MUTE
Q711
Q710
VHF/UHF IN
SPLITTER
TU RF
IF
SAW FILTER
AUDIO IF PRE AMP
SIF DET
4.5MHz B.P.F
LIM
FM DET
DE-EMPH
18
MONO BUFFER
TU AU(L)
TU AU(R)
STD
AUDIO
X815
(SEE PAGE 3-24)
TV
fas TRAP
IF PRE AMP
VHF/UHF OUT
SAW FILTER
VIF AMP
VIDEO DET
4.5MHz TRAP
EQ
VIDEO
22
TU VIDEO
VIDEO
(SEE PAGE 3-8)
TUNER
AGC
VTR
RF AGC
IF AGC
S701
RF UNIT
3CH
4CH
5
RF MOD
AFT DET
APC DET
VCO
AFC
VCO
VIDEO
MOD V
6
(SEE PAGE 3-8)
AUDIO
MOD A
7
(SEE PAGE 3-24)
PLL CLK
PLL DATA
TU ENABLE
12
13
14
CLK
DATA
ENABLE
SERVO/SYSTEM CONTROL
AFT
20
AFT
(SEE PAGE 3-11)
05

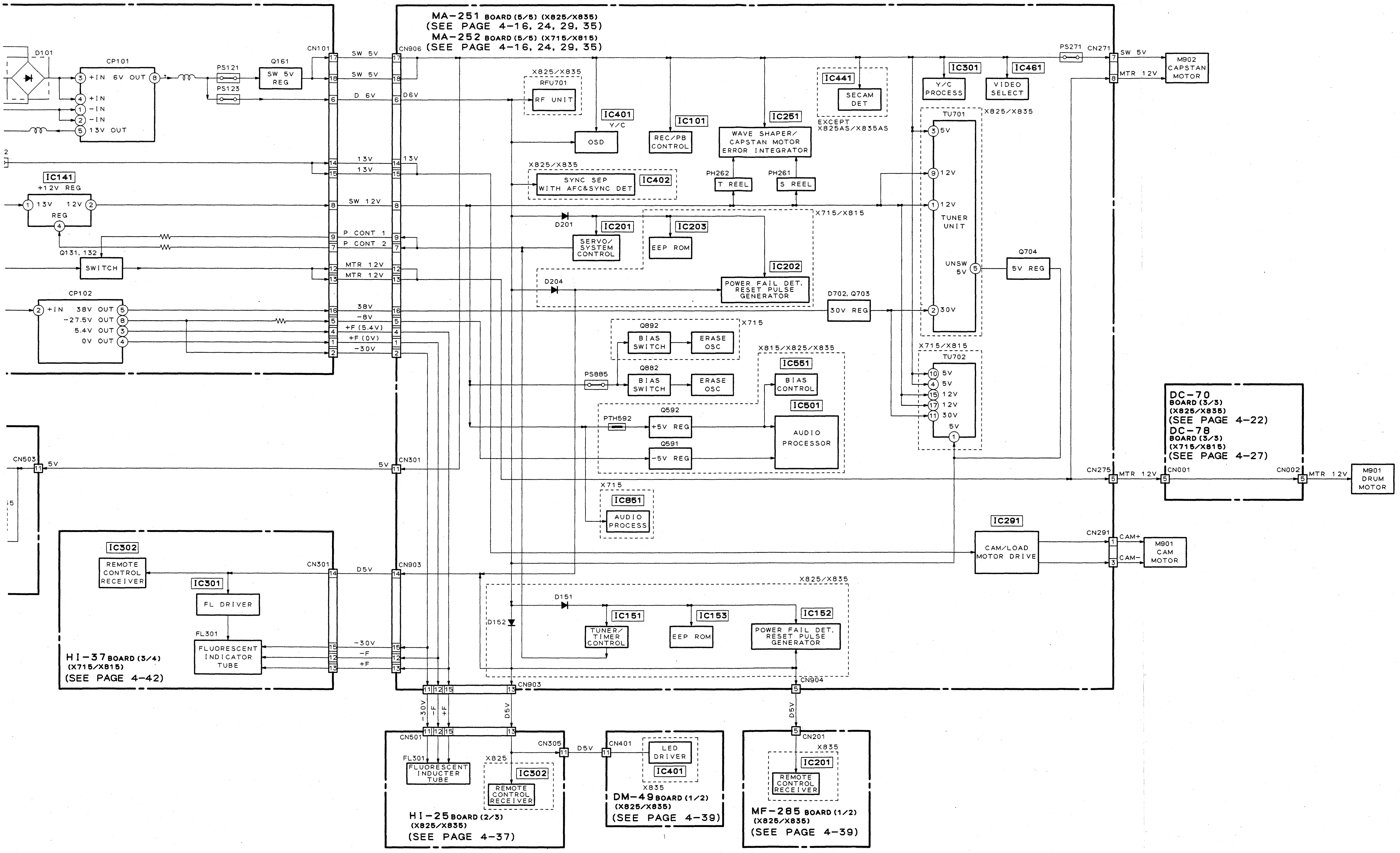
3-6. AUDIO/IO BLOCK DIAGRAM


MA-251/252 BOARD (3/5)
(SEE PAGE 4-29)
CN851
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
CN881
Q881
T881
BIAS ERASE OSC
Q882
SW 12V
X715/X815
Q891
T891
Q892
Q886
BIAS SWITCH
IC551
BIAS CONTROL
X815/X825/X835
X715
IC851
AUDIO PROCESS
REC AMP
REC CTRL
MUTE
BUFF
MUTE SWITCH
Q853
EQ CTRL
INPUT SWITCH
NA SP
NA PB
INPUT SEL
Q532
NT/PAL SW
RV532
VCOfo (R) 1.8MHz
RV531
VCOfo (R) 1.7MHz
RV541
PB RF B.P.F.
IC501
AUDIO PROCESS
MODEM
FM B.P.F.
HiFi DET
PNR R
PNR L
REC AMP
SW
MIX AMP
LINE AMP
OUTPUT SWITCH
INPUT SWITCH
D.O. COM.
ENVE LOPE
DATA DECODER
REG
Q592
SW 12V
Q591
UNSW -8V
RV521
VCOfo (L) 1.3MHz
RV522
VCOfo (L) 1.4MHz
NT/PAL SW
Q522
X815/X825/X835
DRUM HEAD
HIFI AUDIO
CH1
CH2
CN501
IC760
AFM REC/PB AMP
SW 5V
VCC
HEAD AMP
REC ON
BUFFER
CURRENT AMP
AGC DET
AGC AMP
PB ON
CONTROL LOGIC
CN701
CN501
FM PB
FM REC
AF SWP
AF REC P
REC
RP-199/203 BOARD (2/3)
(SEE PAGE 4-7)
X715/X815
FULL ERS
REC
AF REC P
AF SWP
NA REC P
AF ENV
AF DATA
AF CLOCK
NT/PAL
A MUTE
INPUT SEL
NA PB
NA SP
X715
SERVO/ SYSTEM CONTROL
(SEE PAGE 3-11)
MOD A
TU AU (L)
TU AU (R)
STD
EXCEPT X715
TUNER
(SEE PAGE 3-17, 19)
X715
JW615
CJ621 (3/4)
LINE OUT AUDIO (MONO)
LINE OUT AUDIO
X815/X825/X835
HI-25 BOARD (1/3)
(X825/X835)
(SEE PAGE 4-37)
HI-37 BOARD (2/4)
(X715/X815)
(SEE PAGE 4-42)
LINE-2 IN AUDIO
PJ301 (2/2)
CN302
CN905
LINE 2R
LINE 2L
CJ621 (4/4)
LINE-1 IN AUDIO
05

3-7. POWER SUPPLY BLOCK DIAGRAM


PS-357/368 BOARD
(SEE PAGE 4-45)
CJ101
AC IN~
F101
LF102
FILTER
LF103
FILTER
D101
CP101
+IN 6V OUT
+IN
-IN
-IN
13V OUT
PS121
PS123
Q161
SW 5V REG
CN101
SW 5V
SW 5V
D 6V
PS122
IC141
+12V REG
13V 12V
REG
13V
13V
SW 12V
P CONT 1
P CONT 2
Q131, 132
SWITCH
MTR 12V
MTR 12V
PS181
CP102
+IN 38V OUT
-27.5V OUT
5.4V OUT
0V OUT
38V
-8V
+F (5.4V)
+F (0V)
-30V
MA-251 BOARD (5/5) (X825/X835)
(SEE PAGE 4-16, 24, 29, 35)
MA-252 BOARD (5/5) (X715/X815)
(SEE PAGE 4-16, 24, 29, 35)
CN906
D6V
13V
X825/X835
RFU701
RF UNIT
IC401
Y/C
OSD
IC101
REC/PB CONTROL
IC251
WAVE SHAPER/ CAPSTAN MOTOR ERROR INTEGRATOR
IC441
SECAM DET
EXCEPT X825AS/X835AS
IC301
Y/C PROCESS
IC461
VIDEO SELECT
X825/X835
TU701
5V
12V
12V
TUNER UNIT
UNSW 5V
30V
Q704
5V REG
X825/X835
SYNC SEP WITH AFC&SYNC DET
IC402
PH262
T REEL
PH261
S REEL
X715/X815
D201
IC201
SERVO/ SYSTEM CONTROL
IC203
EEP ROM
IC202
POWER FAIL DET. RESET PULSE GENERATOR
D204
D702, Q703
30V REG
X715
Q892
BIAS SWITCH
ERASE OSC
Q882
BIAS SWITCH
ERASE OSC
PS885
X815/X825/X835
IC551
BIAS CONTROL
IC501
AUDIO PROCESSOR
PTH592
Q592
+5V REG
Q591
-5V REG
X715/X815
TU702
5V
5V
12V
12V
30V
5V
X715
IC851
AUDIO PROCESS
IC291
CAM/LOAD MOTOR DRIVE
CJ621 (3/4)
LINE OUT AUDIO (MONO)
R
L
LINE OUT AUDIO
X715
X815/X825/X835
RP-199/203 BOARD (3/3)
(SEE PAGE 4-7)
IC501
VIDEO REC/PB AMP
CN503
5V
X815/X825/X835
IC760
AUDIO REC/PB AMP
05
5V
CN301
IC302
REMOTE CONTROL RECEIVER
IC301
FL DRIVER
FL301
FLUORESCENT INDICATOR TUBE
CN301
D5V
CN903
-30V
-F
+F
HI-37 BOARD (3/4)
(X715/X815)
(SEE PAGE 4-42)
X825/X835
D151
D152
IC151
TUNER/ TIMER CONTROL
IC153
EEP ROM
IC152
POWER FAIL DET. RESET PULSE GENERATOR
CN903
CN904
-30V
-F
+F
D5V
D5V
CN501
FL301
FLUORESCENT INDUCTER TUBE
X825
IC302
REMOTE CONTROL RECEIVER
CN305
HI-25 BOARD (2/3)
(X825/X835)
(SEE PAGE 4-37)
D5V
CN401
LED DRIVER
IC401
X835
DM-49 BOARD (1/2)
(X825/X835)
(SEE PAGE 4-39)
CN201
X835
IC201
REMOTE CONTROL RECEIVER
MF-285 BOARD (1/2)
(X825/X835)
(SEE PAGE 4-39)

DIAGRAM


D101
CP101
+IN 6V OUT
+IN
-IN
-IN
13V OUT
PS121
PS123
Q161
SW 5V REG
CN101
SW 5V
SW 5V
D 6V
13V
13V
IC141
+12V REG
13V 12V
REG
SW 12V
P CONT 1
P CONT 2
Q131, 132
SWITCH
MTR 12V
MTR 12V
CP102
+IN 38V OUT
-27.5V OUT
5.4V OUT
0V OUT
38V
-8V
+F (5.4V)
+F (0V)
-30V
CN503
5V
MA-251 BOARD (5/5) (X825/X835)
(SEE PAGE 4-16, 24, 29, 35)
MA-252 BOARD (5/5) (X715/X815)
(SEE PAGE 4-16, 24, 29, 35)
CN906
D6V
X825/X835
RFU701
RF UNIT
IC401
Y/C
OSD
IC101
REC/PB CONTROL
IC251
WAVE SHAPER/ CAPSTAN MOTOR ERROR INTEGRATOR
IC441
SECAM DET
EXCEPT X825AS/X835AS
IC301
Y/C PROCESS
IC461
VIDEO SELECT
PS271
CN271
SW 5V
MTR 12V
M902 CAPSTAN MOTOR
X825/X835
SYNC SEP WITH AFC&SYNC DET
IC402
PH262
T REEL
PH261
S REEL
TU701
X825/X835
5V
12V
12V
TUNER UNIT
UNSW 5V
30V
X715/X815
D201
IC201
SERVO/ SYSTEM CONTROL
IC203
EEP ROM
IC202
POWER FAIL DET. RESET PULSE GENERATOR
D204
Q704
5V REG
D702, Q703
30V REG
Q892
BIAS SWITCH
ERASE OSC
X715
X815/X825/X835
PS885
Q882
BIAS SWITCH
ERASE OSC
IC551
BIAS CONTROL
IC501
Q592
PTH592
+5V REG
Q591
-5V REG
AUDIO PROCESSOR
X715/X815
TU702
5V
5V
12V
12V
30V
5V
CN301
5V
X715
IC851
AUDIO PROCESS
IC291
CAM/LOAD MOTOR DRIVE
CN291
CAM+
CAM-
M901 CAM MOTOR
DC-70 BOARD (3/3) (X825/X835)
(SEE PAGE 4-22)
DC-78 BOARD (3/3) (X715/X815)
(SEE PAGE 4-27)
CN275
MTR 12V
CN001
CN002
MTR 12V
M901 DRUM MOTOR
IC302
REMOTE CONTROL RECEIVER
IC301
FL DRIVER
FL301
FLUORESCENT INDICATOR TUBE
CN301
D5V
-30V
-F
+F
HI-37 BOARD (3/4)
(X715/X815)
(SEE PAGE 4-42)
CN903
X825/X835
D151
D152
IC151
TUNER/ TIMER CONTROL
IC153
EEP ROM
IC152
POWER FAIL DET. RESET PULSE GENERATOR
CN903
CN904
-30V
-F
+F
D5V
D5V
CN501
FL301
FLUORESCENT INDUCTER TUBE
X825
IC302
REMOTE CONTROL RECEIVER
CN305
HI-25 BOARD (2/3)
(X825/X835)
(SEE PAGE 4-37)
D5V
CN401
LED DRIVER
IC401
X835
DM-49 BOARD (1/2)
(X825/X835)
(SEE PAGE 4-39)
CN201
X835
IC201
REMOTE CONTROL RECEIVER
MF-285 BOARD (1/2)
(X825/X835)
(SEE PAGE 4-39)

SECTIONN 4
PRINTED WIRNIG BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For printed wiring boards:

- ○——— : indicates a lead wire mounted on the component side.
- ●——— : indicates a lead wire mounted on the printed side.
- ○ : Through hole.
- ■ : Parts mounted on the conductor side.
- ▒ : Pattern from the side which enables seeing.
- ▒ : Pattern of the rear side.*
- Circled numbers refer to waveforms.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

For schematic diagram:

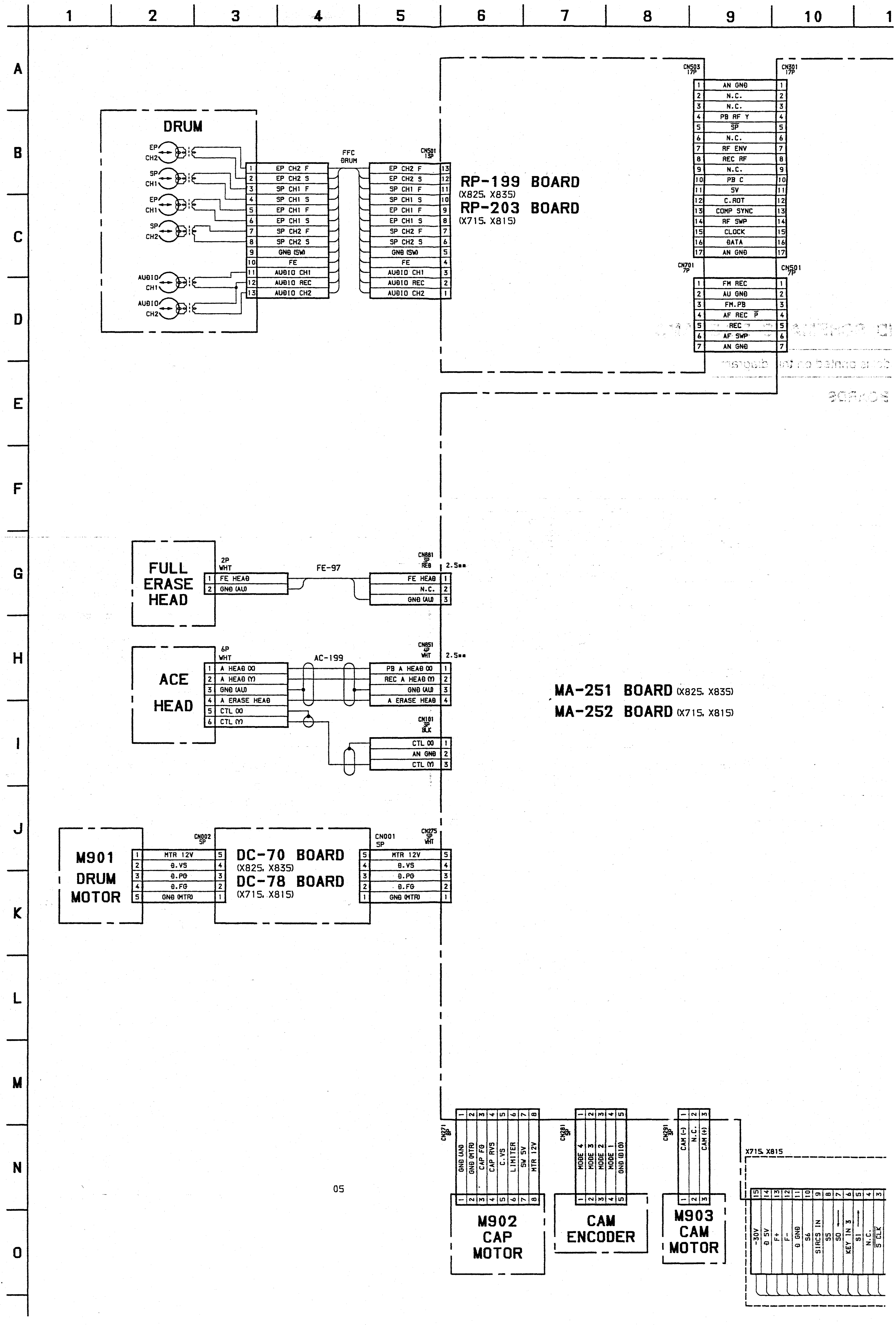
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W (Chip resistors: 1/10W) unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.*
- ▬▬ : B + Line.*
- ▬ ▬ : B − Line.*
- ⇨ : IN/OUT direction of B line (+ , −).*
- Circled numbers refer to waveforms.*
- Voltages are dc between measurement point.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

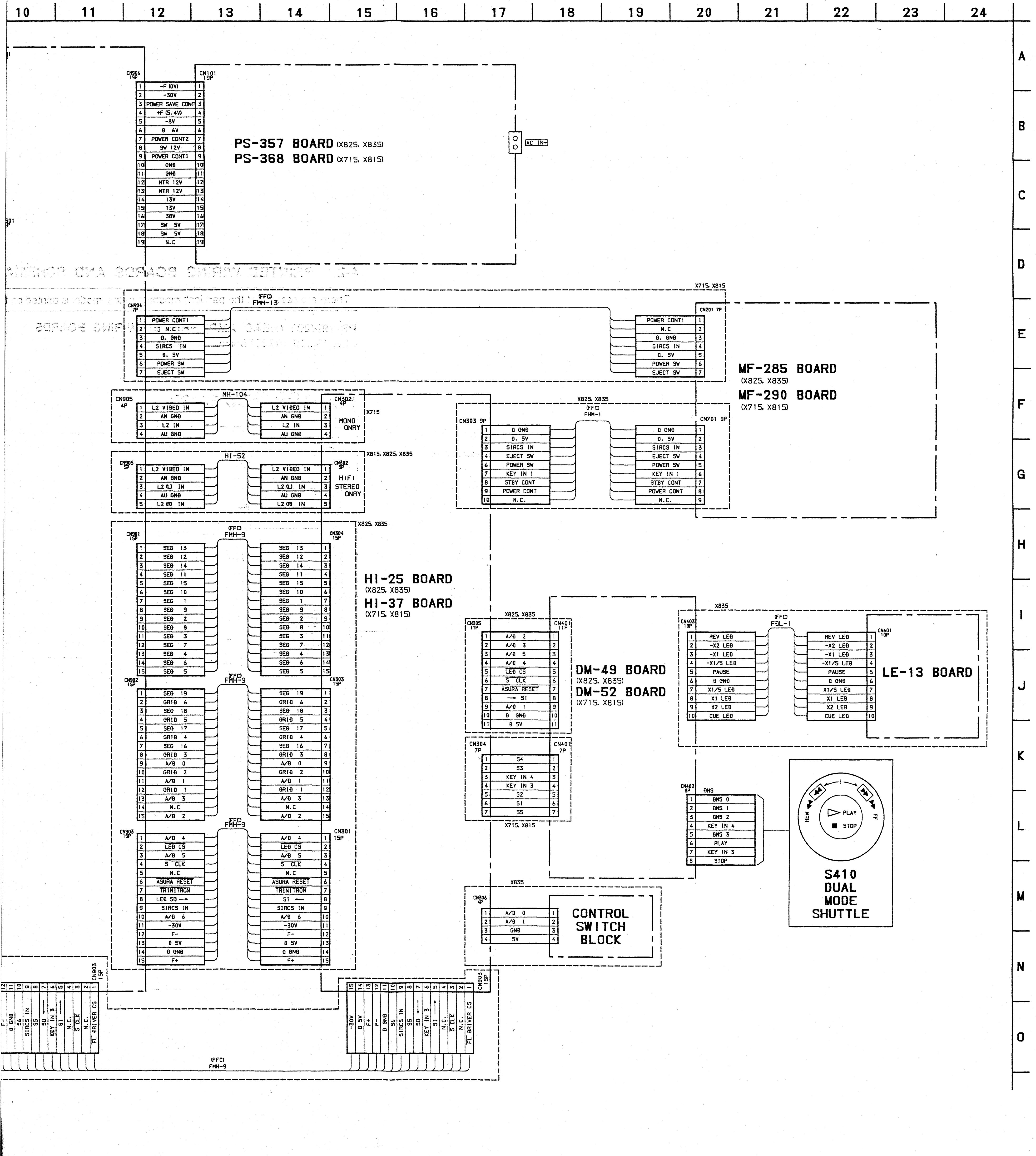
When indicating parts by reference number, please include the board name.

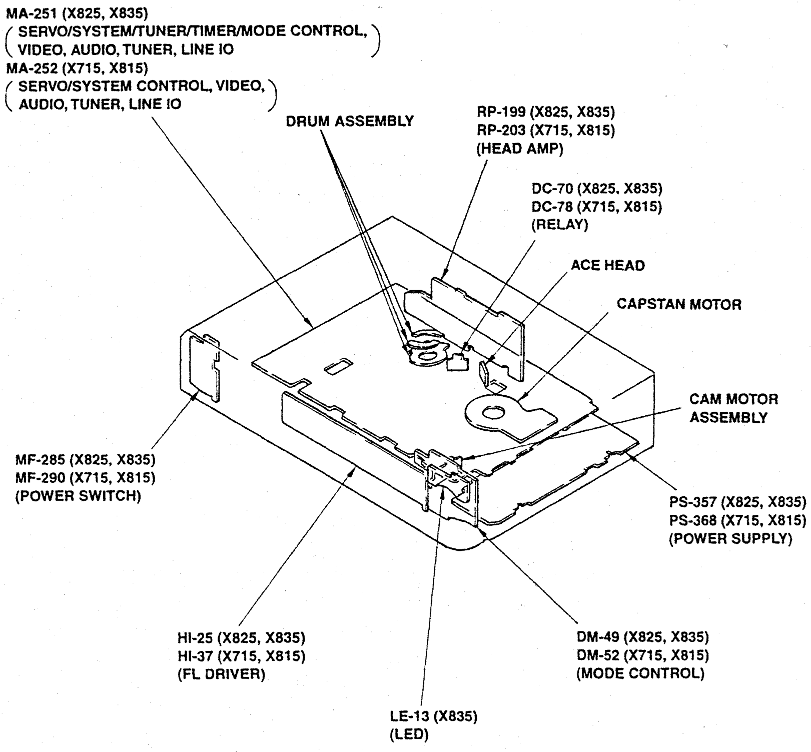
- * : indicated by the color red.

4-1. FRAME SCHEMATIC DIAGRAM



1 2 3 4 5 6 7 8 9 10
A B C D E F G H I J K L M N O
DRUM
EP CH2
SP CH1
EP CH1
SP CH2
AUDIO CH1
AUDIO CH2
1 EP CH2 F
2 EP CH2 S
3 SP CH1 F
4 SP CH1 S
5 EP CH1 F
6 EP CH1 S
7 SP CH2 F
8 SP CH2 S
9 GND (SW)
10 FE
11 AUDIO CH1
12 AUDIO REC
13 AUDIO CH2
FFC DRUM
CN501 13P
RP-199 BOARD
(X825, X835)
RP-203 BOARD
(X715, X815)
CN503 17P
CN301 17P
1 AN GND
2 N.C.
3 N.C.
4 PB RF Y
5 SP
6 N.C.
7 RF ENV
8 REC RF
9 N.C.
10 PB C
11 5V
12 C.ROT
13 COMP SYNC
14 RF SWP
15 CLOCK
16 DATA
17 AN GND
CN701 7P
CN501 7P
1 FM REC
2 AU GND
3 FM.PB
4 AF REC P
5 REC
6 AF SWP
7 AN GND
FULL ERASE HEAD
2P WHT
1 FE HEAD
2 GND (AU)
FE-97
CN881 3P RED
FE HEAD
N.C.
GND (AU)
2.5mm
ACE HEAD
6P WHT
1 A HEAD (X)
2 A HEAD (Y)
3 GND (AU)
4 A ERASE HEAD
5 CTL (X)
6 CTL (Y)
AC-199
CN851 4P WHT
PB A HEAD (X)
REC A HEAD (Y)
GND (AU)
A ERASE HEAD
CN101 3P BLK
CTL (X)
AN GND
CTL (Y)
MA-251 BOARD (X825, X835)
MA-252 BOARD (X715, X815)
M901 DRUM MOTOR
CN002 5P
1 MTR 12V
2 D.VS
3 D.PG
4 D.FG
5 GND (MTR)
DC-70 BOARD
(X825, X835)
DC-78 BOARD
(X715, X815)
CN001 5P
CN275 5P WHT
MTR 12V
D.VS
D.PG
D.FG
GND (MTR)
CN271 8P
GND (AN)
GND (MTR)
CAP FG
CAP RVS
C.VS
LIMITER
SW 5V
MTR 12V
M902 CAP MOTOR
CN881 5P
MODE 4
MODE 3
MODE 2
MODE 1
GND (DIG)
CAM ENCODER
CN391 3P
CAM (−)
N.C.
CAM (+)
M903 CAM MOTOR
X715, X815
−30V
D 5V
F+
F−
D GND
S6
SIRCS IN
S5
SO
KEY IN 3
S1
N.C.
S CLK
05


10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
CN906 19P
CN101 19P
-F (0V)
-30V
POWER SAVE CONT
+F (5.4V)
-8V
0 6V
POWER CONT2
SW 12V
POWER CONT1
GND
GND
MTR 12V
MTR 12V
13V
13V
38V
SW 5V
SW 5V
N.C
PS-357 BOARD (X825, X835)
PS-368 BOARD (X715, X815)
AC IN~
X715, X815
CN904 7P
(FFC) FMH-13
CN201 7P
POWER CONT1
N.C.
D. GND
SIRCS IN
D. 5V
POWER SW
EJECT SW
MF-285 BOARD
(X825, X835)
MF-290 BOARD
(X715, X815)
CN905 4P
MH-104
CN302 4P
L2 VIDEO IN
AN GND
L2 IN
AU GND
X715
MONO ONRY
X825, X835
(FFC) FHM-1
CN303 9P
CN701 9P
D GND
D. 5V
SIRCS IN
EJECT SW
POWER SW
KEY IN 1
STBY CONT
POWER CONT
N.C.
CN905 5P
HI-52
CN302 5P
X815, X825, X835
L2 (L) IN
L2 (R) IN
HIFI STEREO ONRY
X825, X835
CN901 15P
(FFC) FMH-9
CN304 15P
SEG 13
SEG 12
SEG 14
SEG 11
SEG 15
SEG 10
SEG 1
SEG 9
SEG 2
SEG 8
SEG 3
SEG 7
SEG 4
SEG 6
SEG 5
HI-25 BOARD
(X825, X835)
HI-37 BOARD
(X715, X815)
CN902 15P
(FFC) FMH-9
CN303 15P
SEG 19
GRID 6
SEG 18
GRID 5
SEG 17
GRID 4
SEG 16
GRID 3
A/D 0
GRID 2
A/D 1
GRID 1
A/D 3
N.C
A/D 2
CN903 15P
(FFC) FMH-9
CN301 15P
A/D 4
LED CS
A/D 5
S CLK
N.C
ASURA RESET
TRINITRON
LED SO
S1
SIRCS IN
A/D 6
-30V
F-
0 5V
0 GND
F+
X825, X835
CN305 11P
CN401 11P
A/D 2
A/D 3
A/D 5
A/D 4
LED CS
S CLK
ASURA RESET
S1
A/D 1
0 GND
0 5V
DM-49 BOARD
(X825, X835)
DM-52 BOARD
(X715, X815)
CN304 7P
CN401 7P
S4
S3
KEY IN 4
KEY IN 3
S2
S1
S5
X715, X815
X835
CN403 10P
(FFC) FDL-1
CN601 10P
REV LED
-X2 LED
-X1 LED
-X1/5 LED
PAUSE
0 GND
X1/5 LED
X1 LED
X2 LED
CUE LED
LE-13 BOARD
CN402 8P
BMS
BMS 0
BMS 1
BMS 2
KEY IN 4
BMS 3
PLAY
KEY IN 3
STOP
REV
PLAY
STOP
FF
S410
DUAL
MODE
SHUTTLE
X835
CN306 4P
A/D 0
A/D 1
GND
5V
CONTROL
SWITCH
BLOCK
CN903 15P
F-
0 GND
S6
SIRCS IN
S5
S0
KEY IN 3
S1
N.C.
S CLK
N.C.
FL DRIVER CS
-30V
0 5V
F+
(FFC) FMH-9


MA-251 (X825, X835)
(SERVO/SYSTEM/TUNER/TIMER/MODE CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
MA-252 (X715, X815)
(SERVO/SYSTEM CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
DRUM ASSEMBLY
RP-199 (X825, X835)
RP-203 (X715, X815)
(HEAD AMP)
DC-70 (X825, X835)
DC-78 (X715, X815)
(RELAY)
ACE HEAD
CAPSTAN MOTOR
CAM MOTOR ASSEMBLY
MF-285 (X825, X835)
MF-290 (X715, X815)
(POWER SWITCH)
PS-357 (X825, X835)
PS-368 (X715, X815)
(POWER SUPPLY)
HI-25 (X825, X835)
HI-37 (X715, X815)
(FL DRIVER)
DM-49 (X825, X835)
DM-52 (X715, X815)
(MODE CONTROL)
LE-13 (X835)
(LED)

4-2. PRINTED WIRING BOARDS AND SCHEM

There are cases that the part isn't mounted in this model is printed o

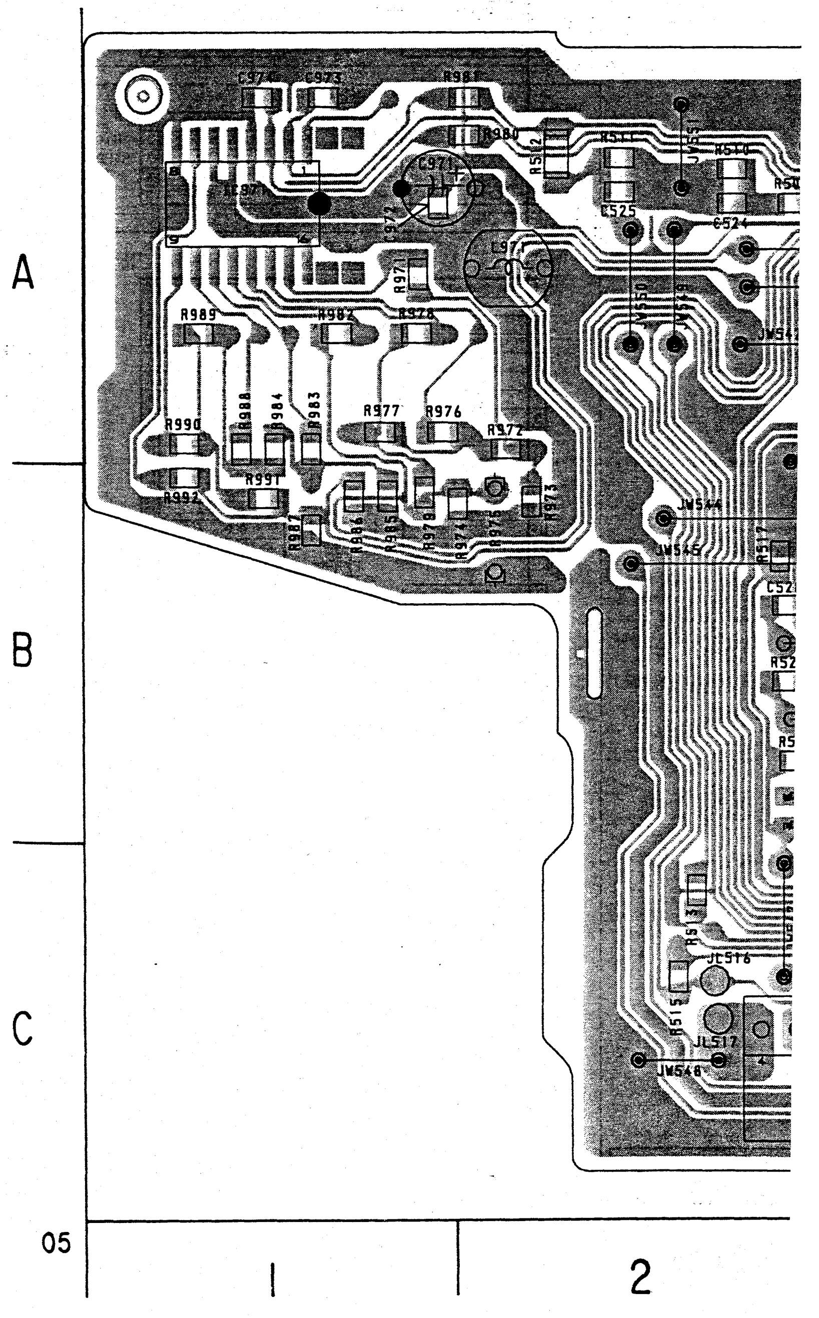
PR-199/203 (HEAD AMP) PRINTED WIRING BOARDS

– Ref. No.: RP-199/203 Boards; 1,000 series –

RP-199/203 BOARD

CN501	B-4
CN502	C-2
CN503	A-4
CN701	A-7
IC501	C-3
IC760	B-5
Q501	B-2
Q502	B-3
Q571	C-4
Q572	C-4
Q573	C-5
Q574	C-6
Q575	C-5
Q901	B-6
Q902	B-7
Q904	B-6
Q905	B-7

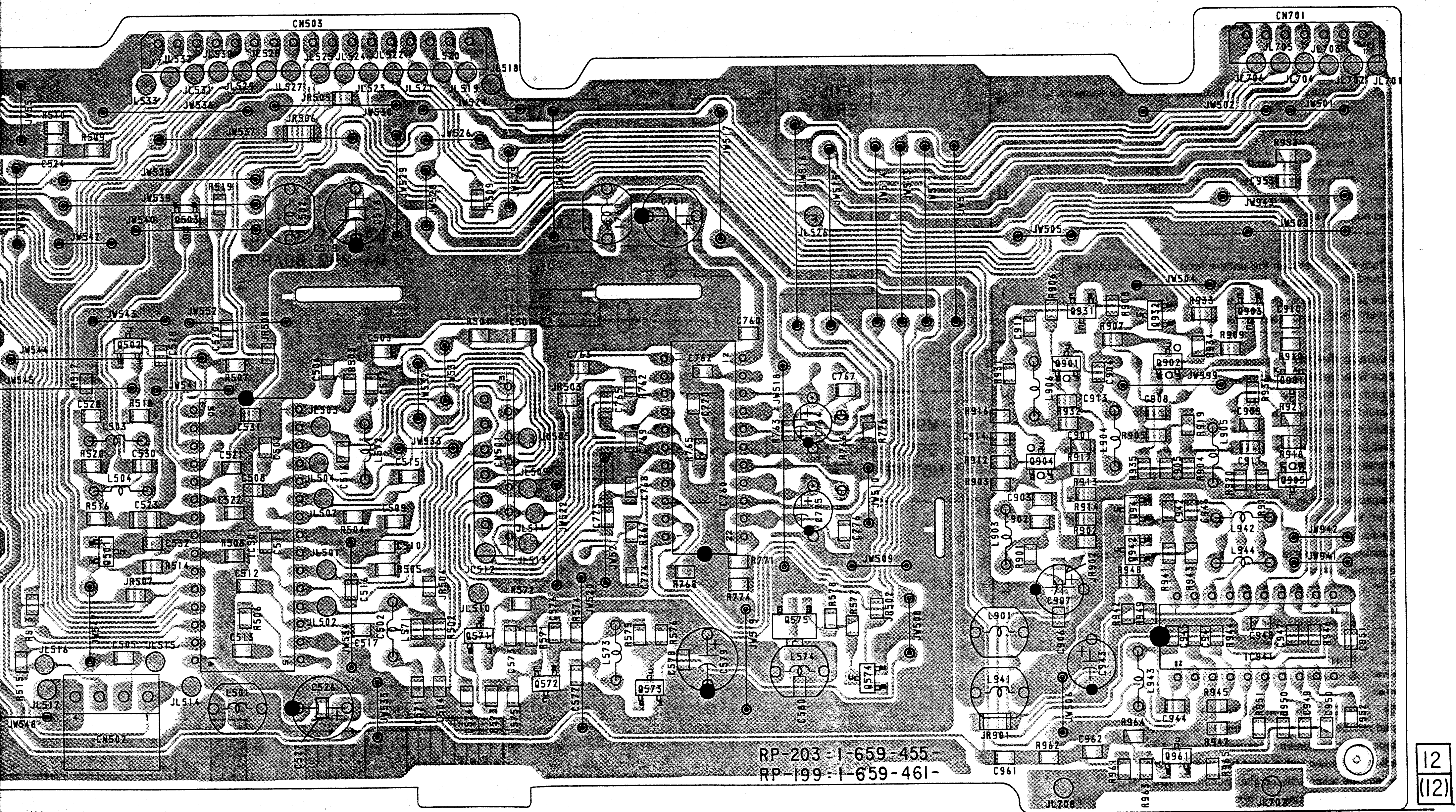
RP-199/203 BOARD


A
B
C
05
1
2
C974
C973
R981
R980
R512
R511
R510
C971
C525
C524
R971
R989
R982
R978
R977
R976
R990
R988
R984
R983
R972
R991
R992
R987
R986
R985
R979
R974
R975
R973
JW544
JW545
R517
JL516
JL517
JW546
R515

D SCHEMATIC DIAGRAMS

del is printed on this diagram.

BOARDS


CN503
CN701
CN502
RP-203 : 1-659-455-
RP-199 : 1-659-461-
IC501
IC760
IC941
JL705
JL703
JL704
JL701
JL702
JL708
JL518
JW501
JW502
JW503
JW505
12
(12)
2
3
4
5
6
7

- Signal path

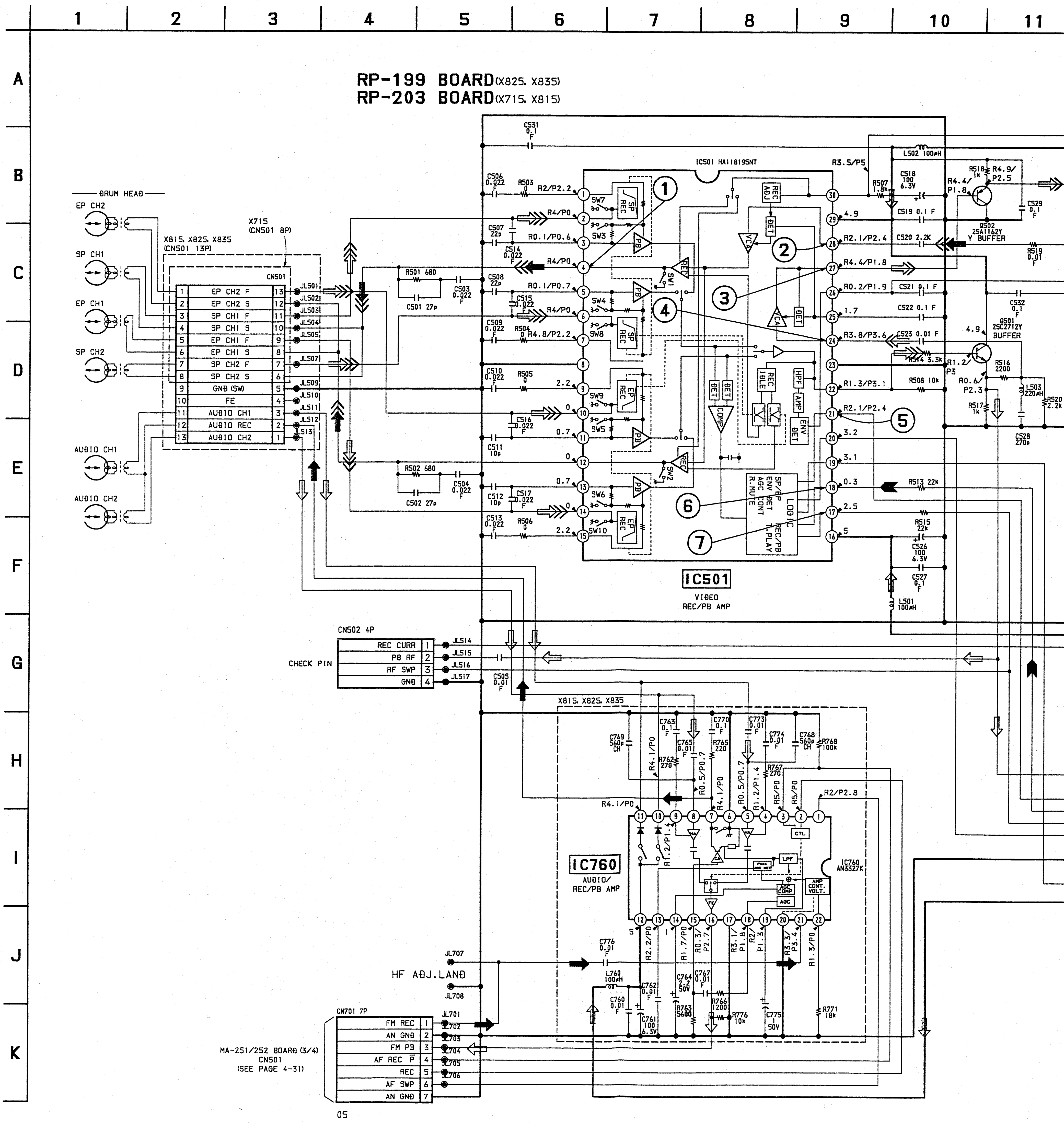
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡≫	➡≫	➡
PB	⇨	⇨≫	⇨≫	⇨

- Signal path

	REC
Ref. signal	➤

PR-199/203 (HEAD AMP) SCHEMATIC DIAGRAM

– Ref. No.: RP-199/203 Boards; 1,000 series –



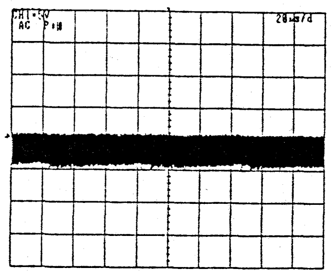
RP-199 BOARD(X825, X835)
RP-203 BOARD(X715, X815)
DRUM HEAD
EP CH2
SP CH1
EP CH1
SP CH2
AUDIO CH1
AUDIO CH2
X815, X825, X835 (CN501 13P)
X715 (CN501 8P)
CN501
EP CH2 F
EP CH2 S
SP CH1 F
SP CH1 S
EP CH1 F
EP CH1 S
SP CH2 F
SP CH2 S
GND (SW)
FE
AUDIO CH1
AUDIO REC
AUDIO CH2
IC501 HA11819SNT
IC501
VIDEO REC/PB AMP
Q502 2SA1162Y Y BUFFER
Q501 2SC2712Y BUFFER
CN502 4P
CHECK PIN
REC CURR
PB RF
RF SWP
GND
IC760
AUDIO/ REC/PB AMP
IC760 AN3327K
HF ADJ.LAND
CN701 7P
FM REC
AN GND
FM PB
AF REC P
REC
AF SWP
AN GND
MA-251/252 BOARD (3/4) CN501 (SEE PAGE 4-31)
05
1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
I
J
K

IAL	AUDIO
Y/CHROMA	SIGNAL
➡≫	➡
⇨≫	⇨

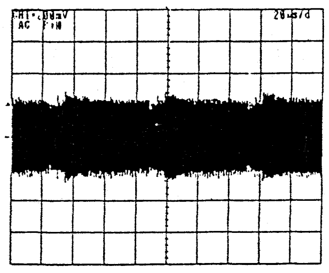
REC
➤

• Waveforms

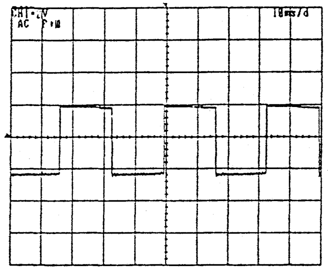
❶ IC501 ④ REC 5Vp-p (H)



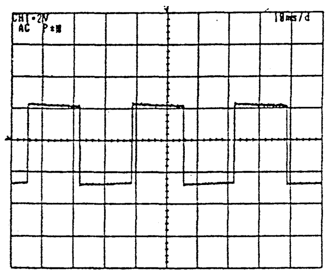
❸ IC501 ㉗ PB 480mVp-p (H)



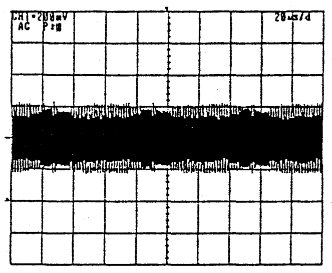
❺ IC501 ㉑ REC/PB 4.4Vp-p (2V)



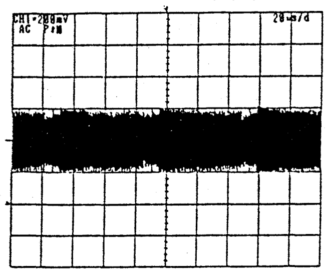
❼ IC501 ⑰ REC/PB 5Vp-p (2V)



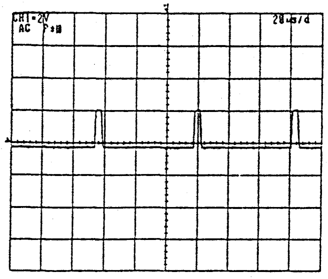
❷ IC501 ㉘ REC 360mV (H)

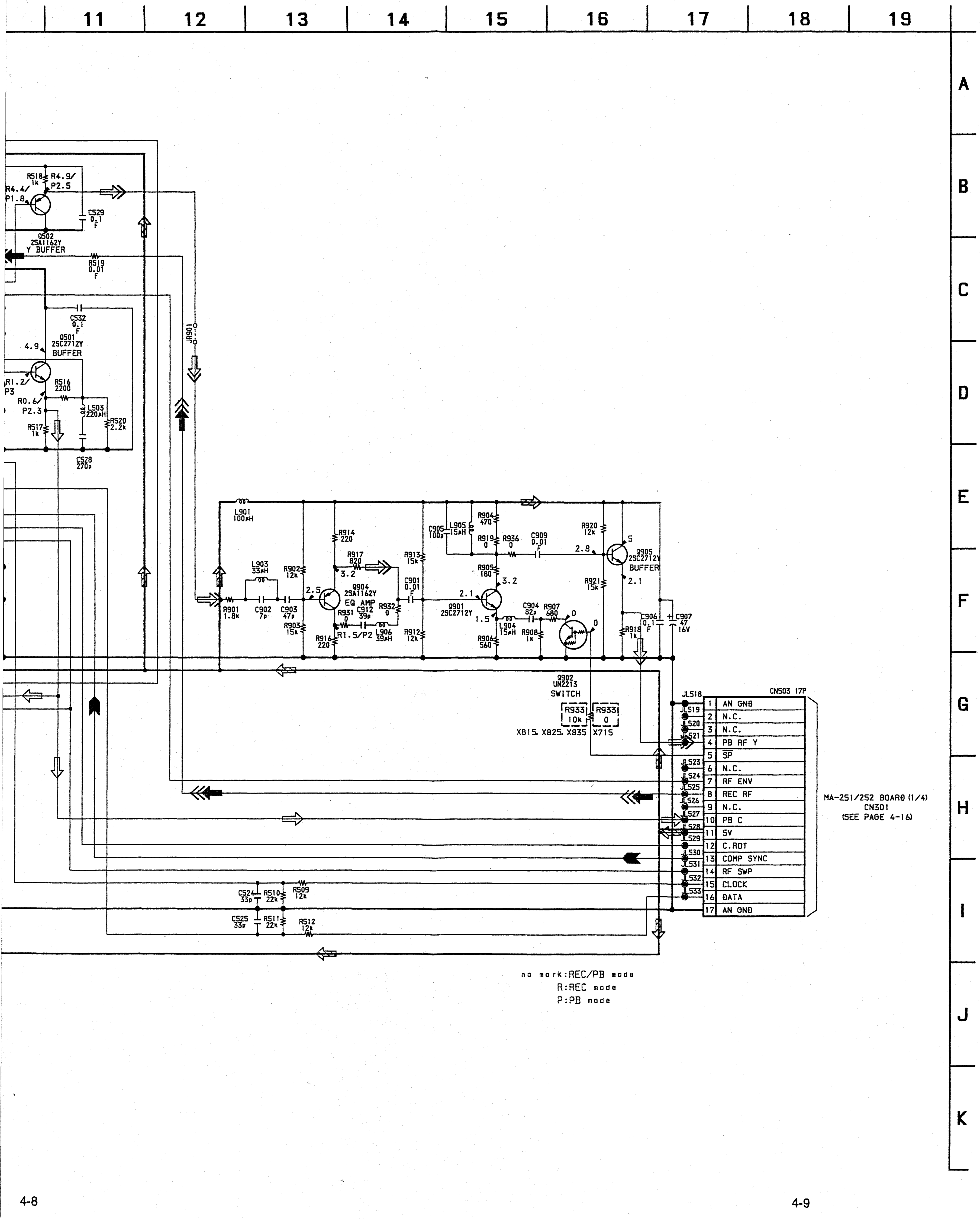


❹ IC501 ㉔ PB 400mVp-p (H)



❻ IC501 ⑱ REC/PB 2.4Vp-p (H)



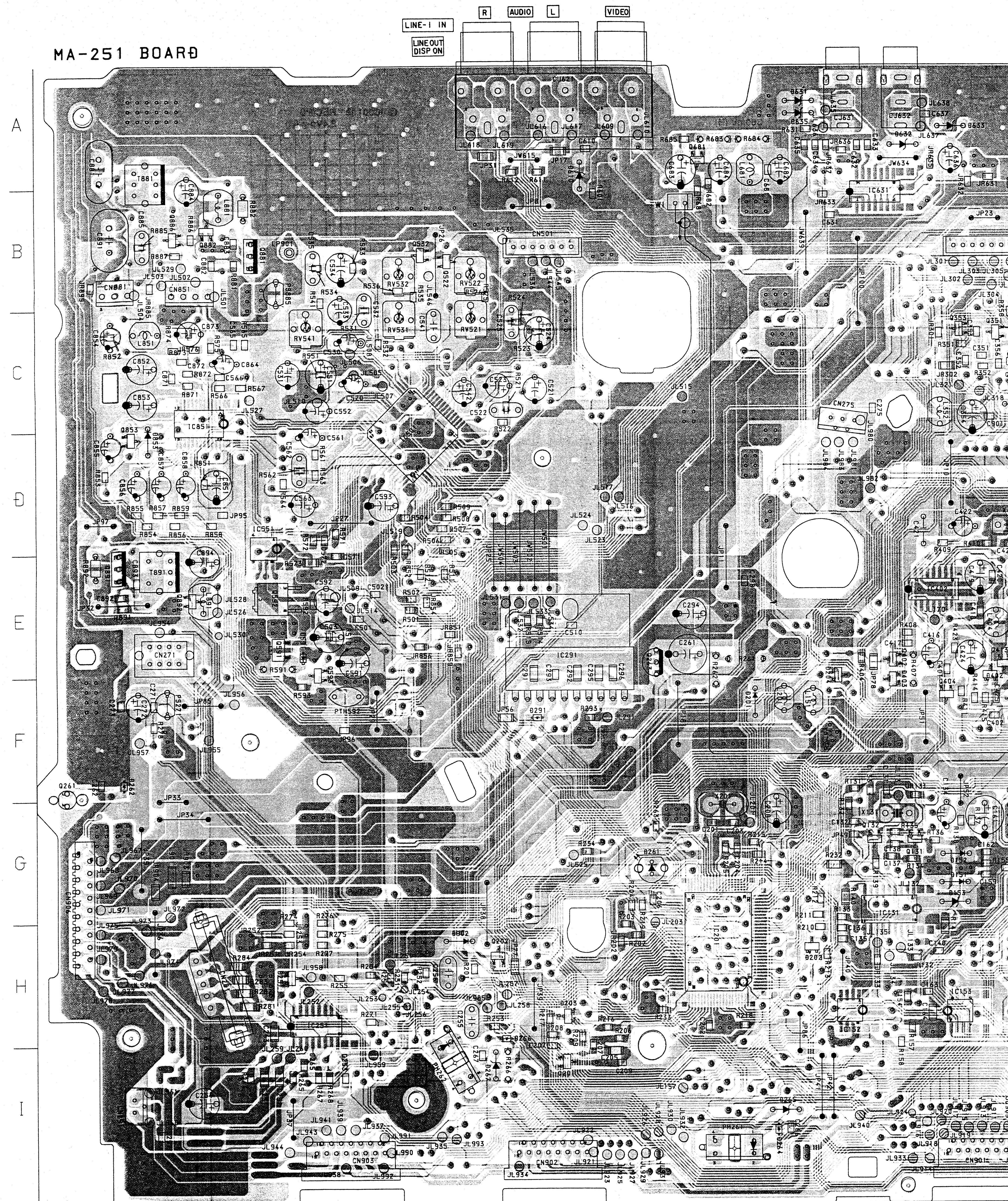


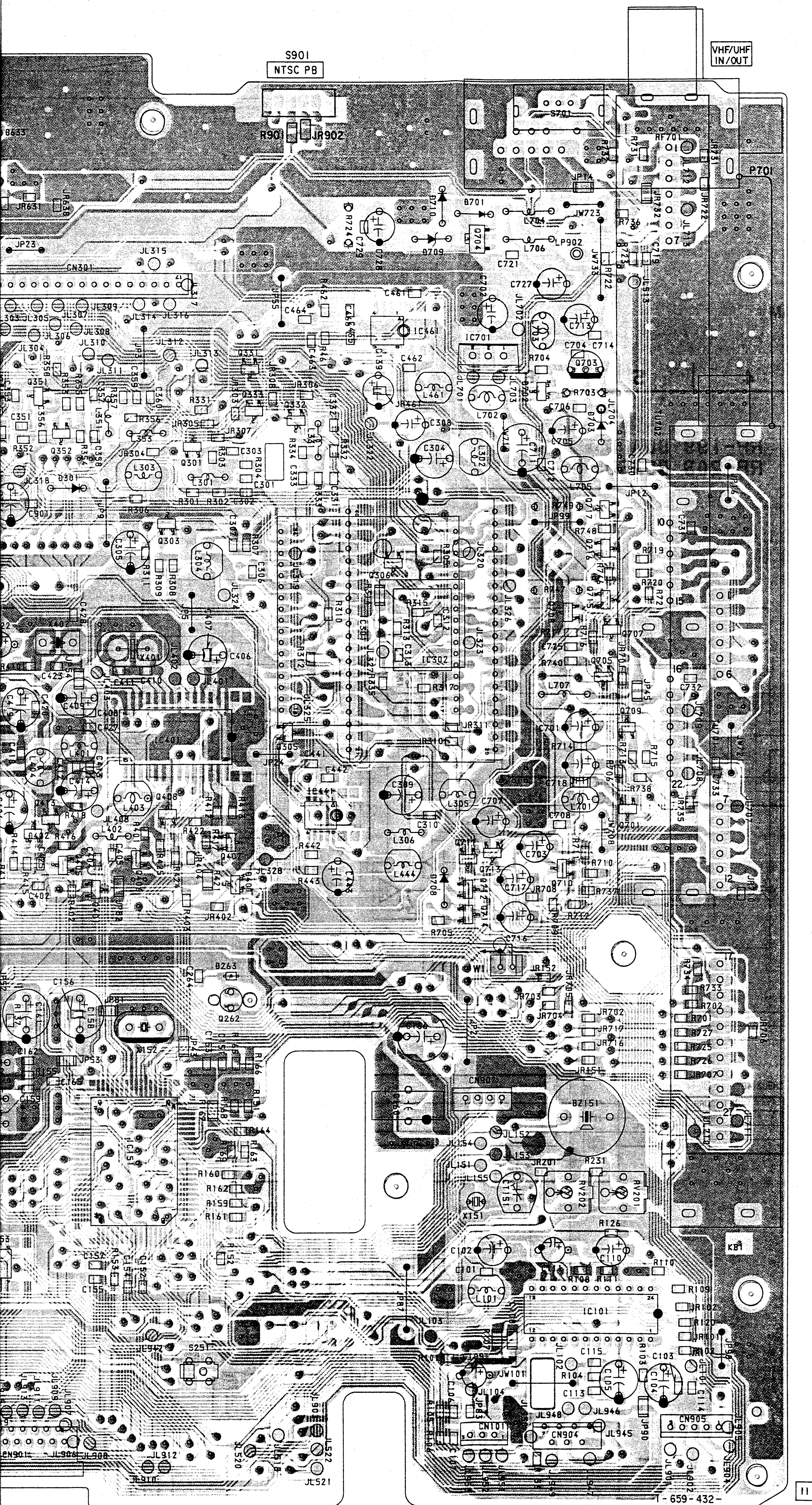
no mark:REC/PB mode
R:REC mode
P:PB mode

There are cases that the part isn't mounted in this model is printed on this diagram.

MA-251 (SERVO/SYSTEM/TUNER/TIMER/MODE CONTROL, VIDEO, AUDIO, IO, TUNER), DC-70 (RELAY) (SLV-X825/X835) PRINTED WIRING BOARDS

– Ref. No.: MA-251 Board; 3,000 series, DC-70 Board; 1,000 series –

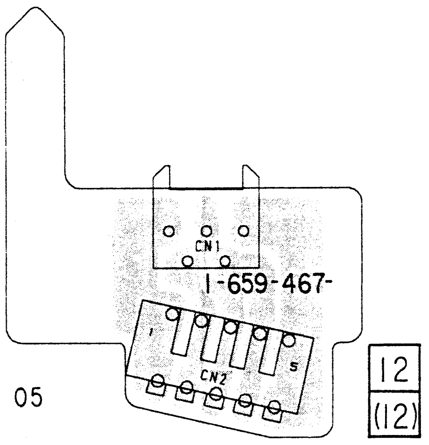

R
AUDIO
L
VIDEO
LINE-1 IN
LINE OUT DISP ON
MA-251 BOARD
A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
7
8
05

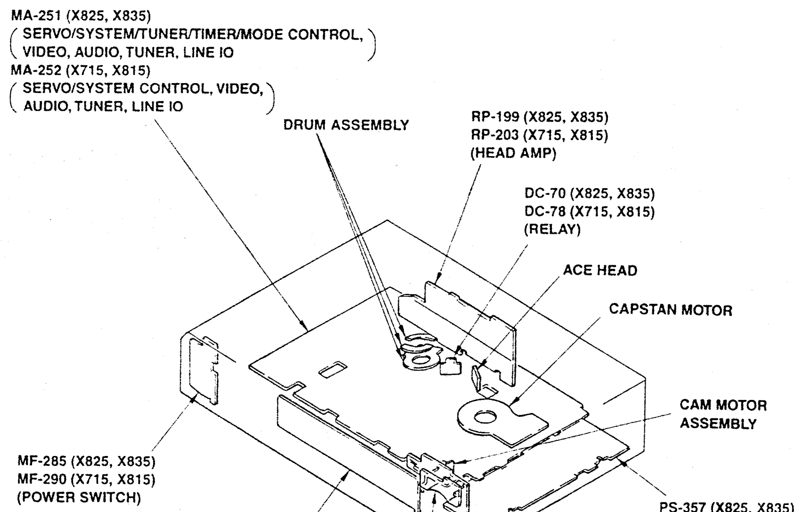

S901
NTSC PB
VHF/UHF IN/OUT
P701
CN301
IC701
IC302
IC101
CN907
BZ151
CN101
CN904
CN905
S251
KB1
1-659-432-
11
9
10
11
12
13

MA251 BOARD

CN101	I-11
CN271	E-2
CN275	C-7
CN281	H-2
CN291	I-1
CN301	B-9
CN501	B-5
CN851	B-2
CN881	B-1
CN901	I-8
CN902	I-5
CN903	I-3
CN906	G-1
CN907	G-11
D151	G-8
D152	G-8
D201	F-6
D202	H-7
D251	H-3
D261	G-6
D265	I-7
D267	I-4
D291	F-5
D301	C-9
D401	F-10
D402	F-8
D403	F-8
D591	E-3
D610	A-5
D702	C-12
D703	C-12
D708	F-11
D709	B-11
D710	A-11
D902	H-4
IC101	I-12
IC151	H-9
IC152	H-7
IC153	H-8
IC201	H-6
IC251	H-3
IC291	E-5
IC301	D-11
IC401	E-9
IC402	E-8
IC441	F-10
IC461	B-11
IC501	D-4
IC551	D-2
Q201	I-5
Q202	H-4
Q261	F-1
Q262	G-10
Q263	E-6
Q301	C-9
Q303	D-9
Q305	E-10
Q306	D-11
Q332	C-10
Q333	C-10
Q351	C-8
Q352	C-9
Q353	C-8
Q402	E-8
Q404	F-8
Q406	F-9
Q407	F-10
Q413	E-9
Q591	E-3
Q592	E-2
Q681	A-6
Q701	E-12
Q703	C-12
Q704	B-11
Q710	F-12
Q711	F-11
Q712	F-11
Q713	F-11
Q714	F-11
Q881	B-2
Q882	B-2
Q886	B-2
Q891	E-1
Q892	E-2

DC-70 BOARD

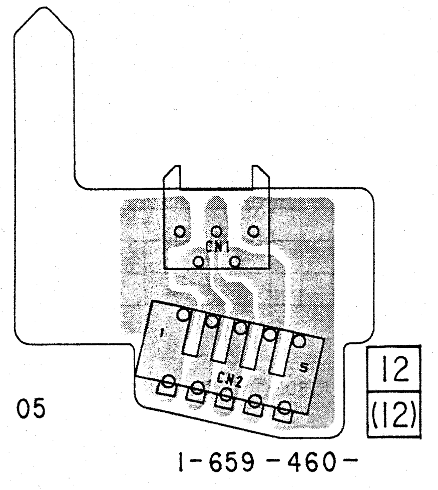

CN1
1-659-467-
CN7
1
5
05
12
(12)

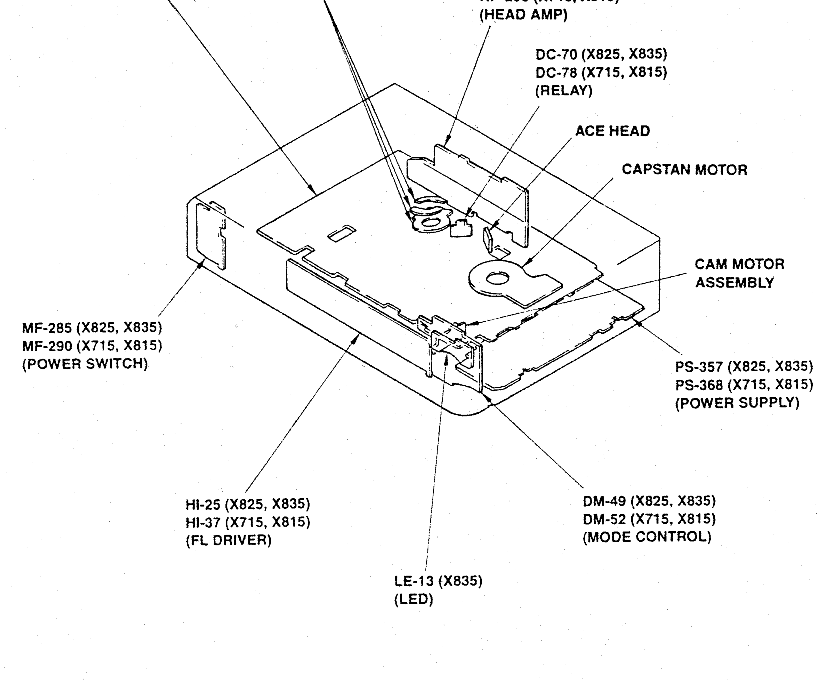

MA-251 (X825, X835)
(SERVO/SYSTEM/TUNER/TIMER/MODE CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
MA-252 (X715, X815)
(SERVO/SYSTEM CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
DRUM ASSEMBLY
RP-199 (X825, X835)
RP-203 (X715, X815)
(HEAD AMP)
DC-70 (X825, X835)
DC-78 (X715, X815)
(RELAY)
ACE HEAD
CAPSTAN MOTOR
CAM MOTOR ASSEMBLY
MF-285 (X825, X835)
MF-290 (X715, X815)
(POWER SWITCH)
PS-357 (X825, X835)
PS-368 (X715, X815)
(POWER SUPPLY)
HI-25 (X825, X835)
HI-37 (X715, X815)
(FL DRIVER)
DM-49 (X825, X835)
DM-52 (X715, X815)
(MODE CONTROL)
LE-13 (X835)
(LED)

MA252 BOARD

CN101	I-11
CN271	E-2
CN275	C-7
CN281	H-2
CN291	I-1
CN301	B-9
CN501	B-5
CN851	B-2
CN881	B-1
CN903	I-3
CN905	I-12
CN906	G-1
CN908	G-12
D201	F-7
D202	H-7
D203	H-5
D204	F-7
D251	H-3
D261	G-6
D265	I-7
D267	I-4
D291	F-5
D301	C-9
D403	E-10
D591	E-3
D610	A-5
D701	B-11
D702	C-12
D703	C-12
D708	F-11
D853	D-1
D902	H-4
D903	A-10
D904	A-10
IC101	I-12
IC201	H-6
IC202	H-7
IC203	H-8
IC251	H-3
IC291	E-5
IC301	D-11
IC401	E-9
IC441	F-10
IC461	B-11
IC501	D-4
IC551	D-2
IC851	C-2
Q201	I-5
Q202	H-5
Q261	F-1
Q262	G-10
Q263	E-6
Q301	C-9
Q303	D-9
Q305	E-10
Q306	D-11
Q332	C-10
Q333	C-10
Q351	C-8
Q352	C-9
Q353	C-8
Q404	E-8
Q405	F-9
Q406	E-8
Q522	B-4
Q532	B-4
Q591	E-3
Q592	E-2
Q681	A-6
Q703	C-12
Q710	F-12
Q711	F-11
Q712	F-11
Q713	F-11
Q714	F-11
Q853	D-1
Q881	B-2
Q882	B-2
Q886	B-2
Q891	E-1
Q892	E-2

DC-78 BOARD

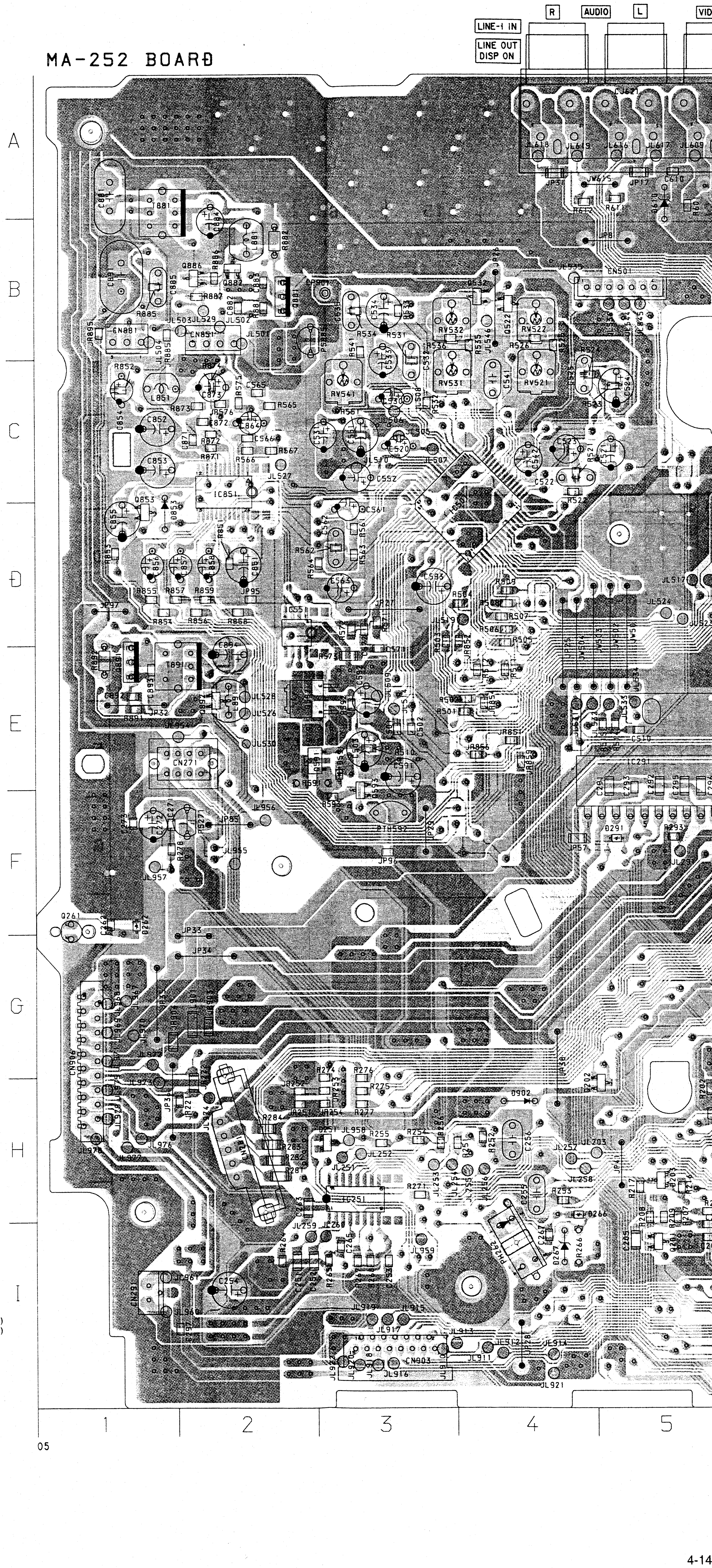

CN1
1
CN2
5
12
(12)
05
1-659-460-


MA-251 (X825, X835)
(SERVO/SYSTEM/TUNER/TIMER/MODE CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
MA-252 (X715, X815)
(SERVO/SYSTEM CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
DRUM ASSEMBLY
RP-199 (X825, X835)
RP-203 (X715, X815)
(HEAD AMP)
DC-70 (X825, X835)
DC-78 (X715, X815)
(RELAY)
ACE HEAD
CAPSTAN MOTOR
CAM MOTOR ASSEMBLY
MF-285 (X825, X835)
MF-290 (X715, X815)
(POWER SWITCH)
PS-357 (X825, X835)
PS-368 (X715, X815)
(POWER SUPPLY)
HI-25 (X825, X835)
HI-37 (X715, X815)
(FL DRIVER)
DM-49 (X825, X835)
DM-52 (X715, X815)
(MODE CONTROL)
LE-13 (X835)
(LED)

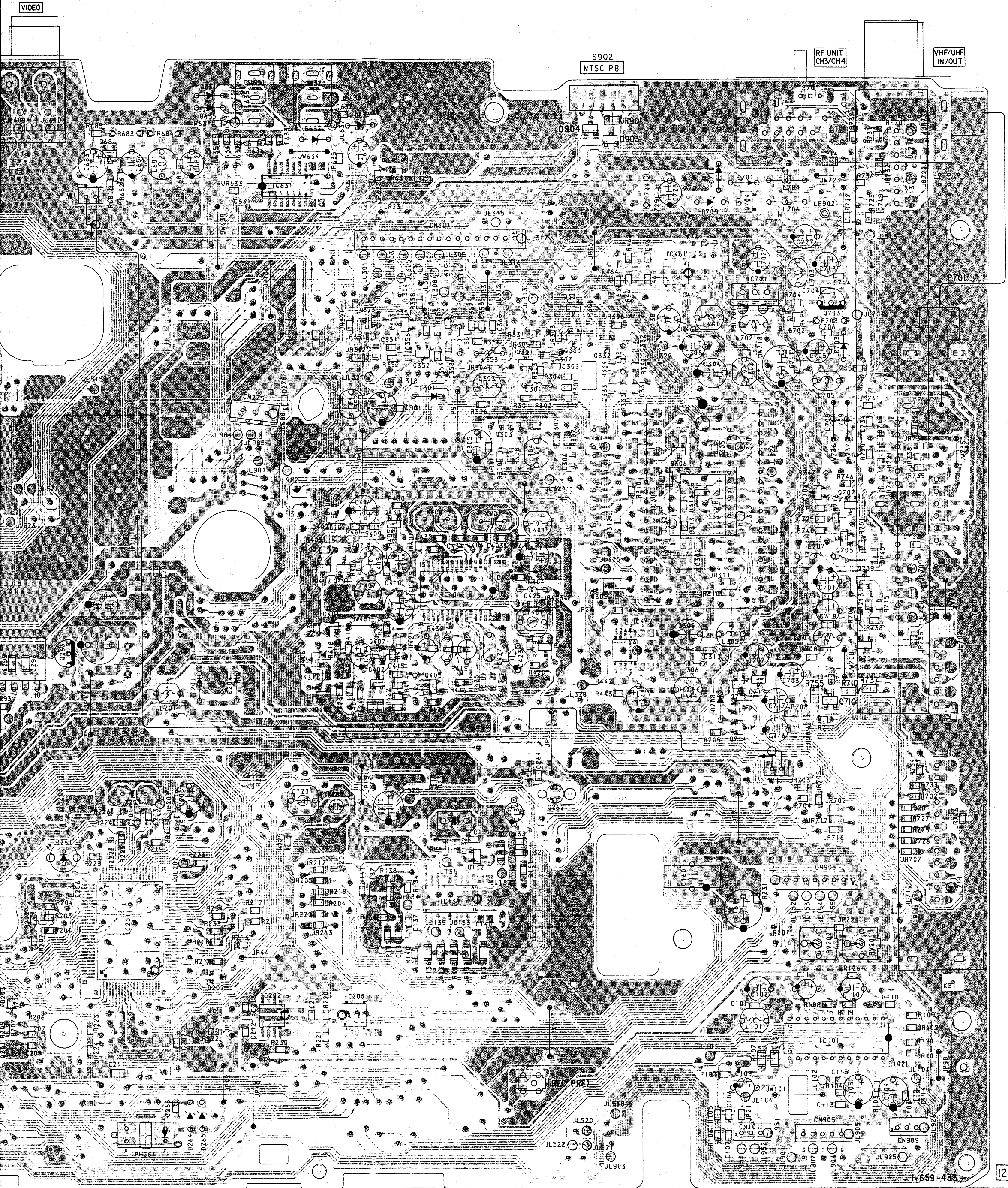
There are cases that the part isn't mounted in this model is printed on this diagram.

MA-252 (SERVO/SYSTEM CONTROL, VIDEO, AUDIO, IO, TUNER), DC-78 (RELAY) (SLV-X715/X815

– Ref. No.: MA-252 Board; 4,000 series, DC-78 Board; 1,000 series –


R
AUDIO
L
VID
LINE-1 IN
LINE OUT DISP ON
MA-252 BOARD
A
B
C
D
E
F
G
H
I
1
2
3
4
5
CN501
CN881
CN851
IC851
CN271
IC251
CN903
CN906
IC291
05

/X815) PRINTED WIRING BOARDS


VIDEO
S902
NTSC P8
RF UNIT
CH3/CH4
VHF/UHF
IN/OUT
P701
CN301
CN275
IC461
IC701
IC401
IC131
IC201
IC202
IC203
IC101
CN908
CN905
CN909
CN101
S251
REC.PRET
1-659-433-
12
5
6
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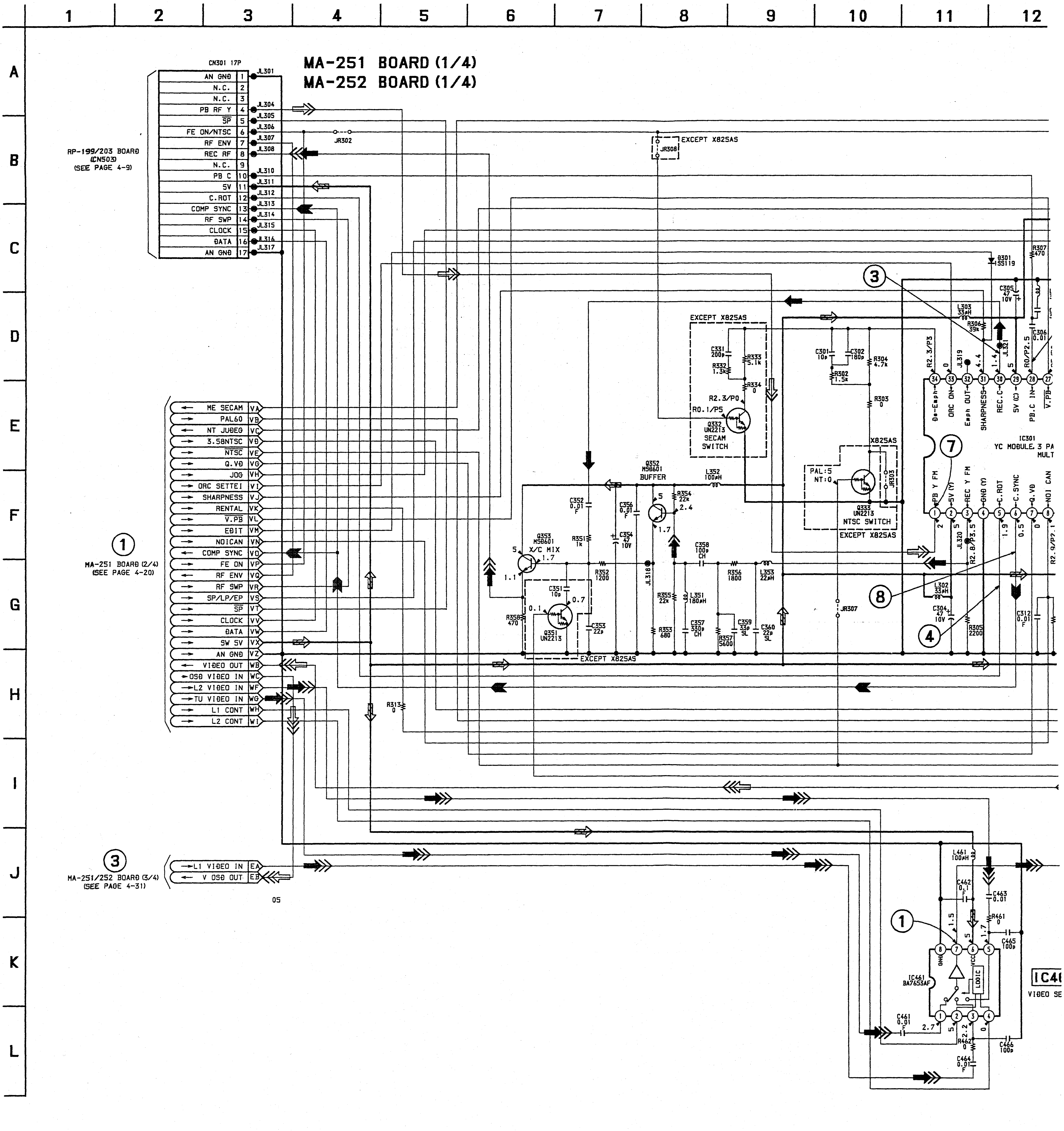
8
9
10
11
12
13

SERVO/SYSTEM CONTROL, VIDEO, AUDIO, IO, TUNER
MA-252, DC-78

MA-251/252 (VIDEO) SCHEMATIC DIAGRAM **• See page 4-10 to 4-15 for printed wiring board.**

– Ref. No.: MA-251 Board; 3,000series, MA-252 Board; 4,000 series –


1
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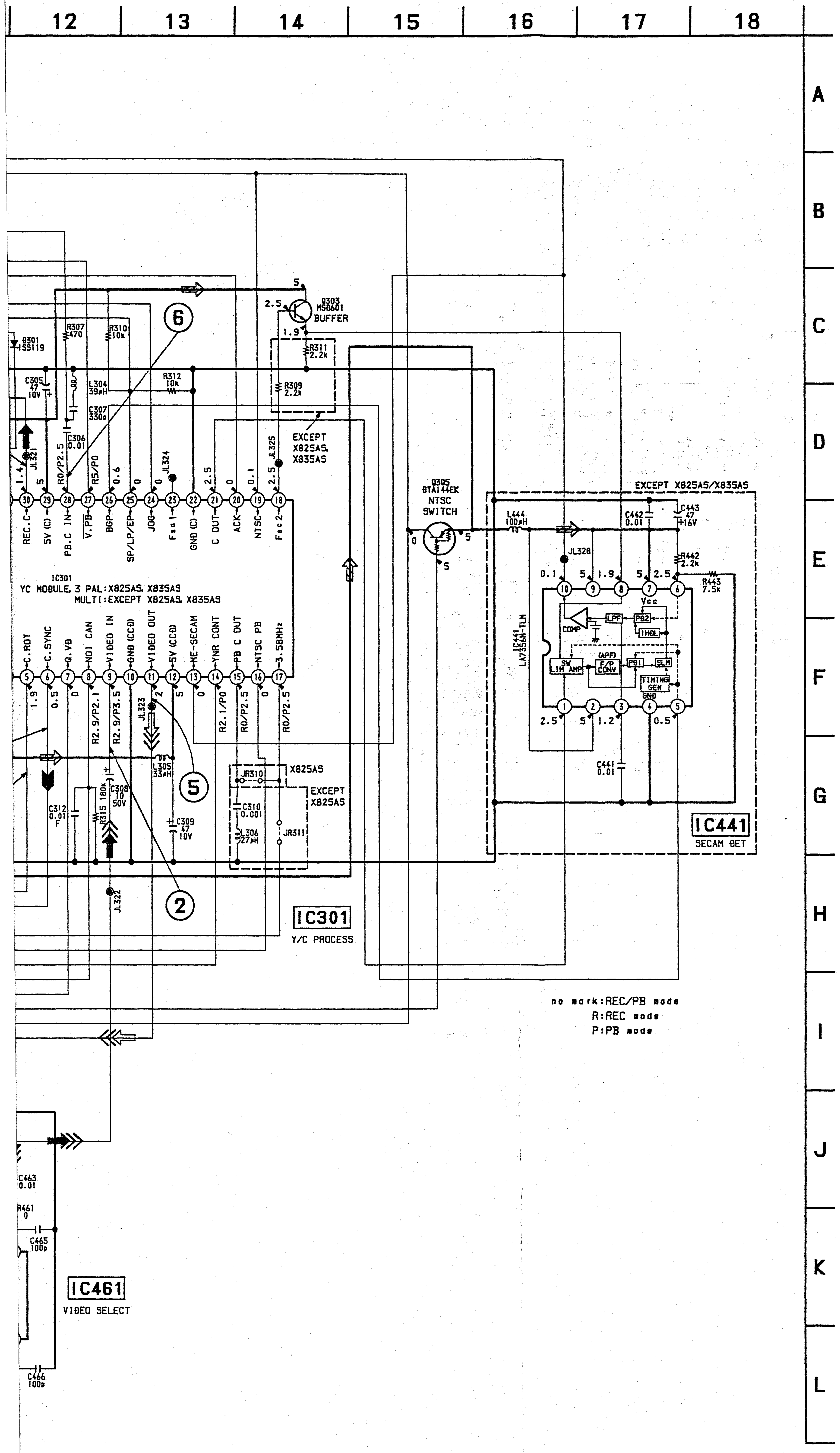
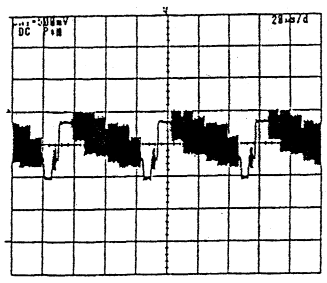
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
K
L
MA-251 BOARD (1/4)
MA-252 BOARD (1/4)
CN301 17P
AN GND 1
N.C. 2
N.C. 3
PB RF Y 4
SP 5
FE ON/NTSC 6
RF ENV 7
REC RF 8
N.C. 9
PB C 10
5V 11
C.ROT 12
COMP SYNC 13
RF SWP 14
CLOCK 15
DATA 16
AN GND 17
JL301
JL304
JL305
JL306
JL307
JL308
JL310
JL311
JL312
JL313
JL314
JL315
JL316
JL317
RP-199/203 BOARD (CN503) (SEE PAGE 4-9)
JR302
JR308
EXCEPT X825AS
①
MA-251 BOARD (2/4) (SEE PAGE 4-20)
ME SECAM VA
PAL60 VB
NT JUDEG VC
3.58NTSC VD
NTSC VE
Q.VD VG
JOG VH
ORC SETTEI VI
SHARPNESS VJ
RENTAL VK
V.PB VL
EDIT VM
NOICAN VN
COMP SYNC VO
FE ON VP
RF ENV VQ
RF SWP VR
SP/LP/EP VS
SP VT
CLOCK VV
DATA VW
SW 5V VX
AN GND VZ
VIDEO OUT WB
OSD VIDEO IN WC
L2 VIDEO IN WF
TU VIDEO IN WG
L1 CONT WH
L2 CONT WI
③
MA-251/252 BOARD (3/4) (SEE PAGE 4-31)
L1 VIDEO IN EA
V OSD OUT EB
05
EXCEPT X825AS
C331 200p
R333 5.1k
R332 1.3k
R334 0
R2.3/P0
R0.1/P5
Q332 UN2213 SECAM SWITCH
Q352 MSB601 BUFFER
L352 100µH
C352 0.01 F
C356 0.01 F
R354 22k
2.4
1.7
C354 47 10V
Q353 MSB601 X/C MIX
R351 1k
1.7
1.1
C351 10p
0.7
0.1
R358 470
Q351 UN2213
C353 22p
R352 1200
JL318
C358 100p CH
R356 1800
L353 22µH
R355 22k
L351 180µH
R353 680
C357 330p CH
R357 5600
C359 33p SL
C360 22p SL
EXCEPT X825AS
C301 10p
C302 180p
R304 4.7k
R302 1.5k
R303 0
X825AS
PAL:5 NT:0
JR303
Q333 UN2213 NTSC SWITCH
EXCEPT X825AS
JR307
R313 0
D301 1SS119
R307 470
③
C305 47 10V
L303 33µH
R306 39k
C306 0.01
JL321
R2.3/P3
0
JL319
4.4
1.4
5
R0/P2.5
34
33
32
31
30
29
28
27
De-Emph
ORC ON
Emph OUT
SHARPNESS
REC.C
5V (C)
PB.C IN
V.PB
IC301 YC MODULE, 3 PA MULT
⑦
PB Y FM
5V (Y)
REC Y FM
GND (Y)
C.ROT
C.SYNC
Q.VD
NOI CAN
1
2
3
4
5
6
7
8
2
JL320
R2.8/3.5
1.9
0.5
0
R2.9/P2.1
⑧
L302 33µH
C304 47 10V
④
R305 2200
C312 0.01 F
L461 100µH
C462 0.1 F
C463 0.01
R461 0
①
1.5
1.7
C465 100p
8
7
6
5
GND
VCC
IC461 BA7653AF
LOGIC
1
2
3
4
C461 0.01 F
2.7
2.2
0
R462 0
C466 100p
C464 0.01 F
IC4
VIDEO SE


12
13
14
15
16
17
18
A
B
C
D
E
F
G
H
I
J
K
L
Q303 MS6601 BUFFER
R307 470
R310 10k
R311 2.2k
R309 2.2k
R312 10k
L304 39µH
C305 47 10V
C306 0.01
C307 330p
D301 1SS119
EXCEPT X825AS X835AS
Q305 DTA144EK NTSC SWITCH
EXCEPT X825AS/X835AS
L444 100µH
C442 0.01
C443 47 16V
R442 2.2k
R443 7.5k
JL328
IC441 LA7358M-TLM
Vcc
COMP
LPF
PG2
1HDL
SW LIM AMP
(APF) F/P CONV
PG1
SLM
TIMING GEN
GND
C441 0.01
IC441
SECAM DET
REC.C
5V (C)
PB.C IN
V.PB
BGP
SP/LP/EP
JOG
Fsc1
GND (C)
C OUT
ACK
NTSC
Fsc2
IC301
YC MODULE, 3 PAL:X825AS, X835AS
MULTI:EXCEPT X825AS, X835AS
C.ROT
C.SYNC
Q.VB
NOI CAN
VIDEO IN
GND (CCD)
VIDEO OUT
5V (CCD)
ME-SECAM
YNR CONT
PB C OUT
NTSC PB
3.58MHz
JL321
JL324
JL325
JL323
JL322
L305 33µH
C308 10 50V
R315 180k
C309 47 10V
C312 0.01
JR310
X825AS
EXCEPT X825AS
C310 0.001
L306 27µH
JR311
IC301
Y/C PROCESS
C463 0.01
R461 0
C465 100p
C466 100p
IC461
VIDEO SELECT
⑥
⑤
②

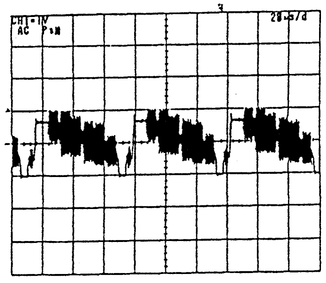
no mark:REC/PB mode
R:REC mode
P:PB mode

• **Waveforms**

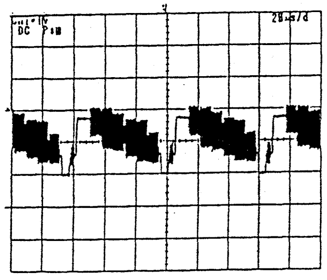
❶ IC461 ③, ⑦ REC
1.1Vp-p (H)



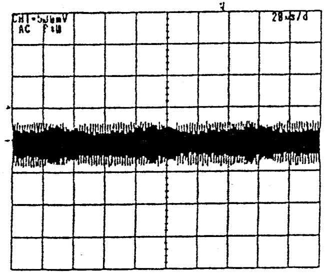
❺ IC302 ⑫ PB
2Vp-p (H)



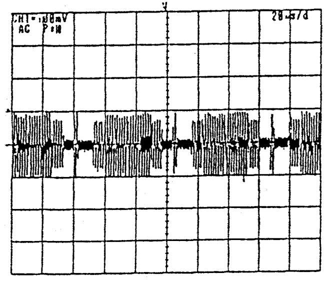
❷ IC302 ⑩ REC
2.2Vp-p (H)



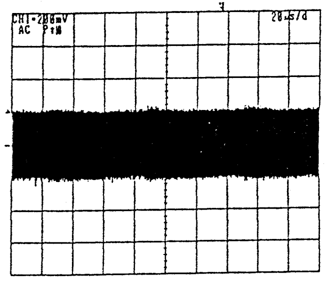
❻ IC302 ㊵ PB
700mVp-p (H)



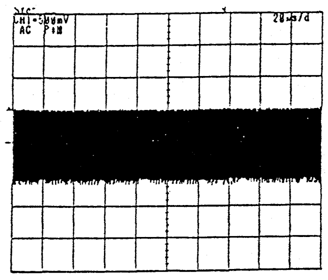
❸ IC302 ㊳ REC
216Vp-p (H)



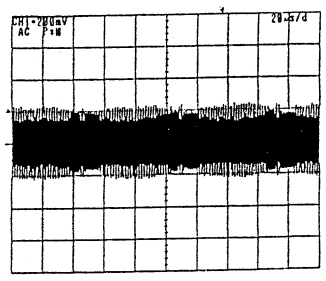
❼ IC302 ① PB
400Vp-p (H)



❹ IC302 ③ REC
500mV/DIV, 20 µs/DIV



❽ Q353 Ⓔ 460mVp-p (H)



- Signal path

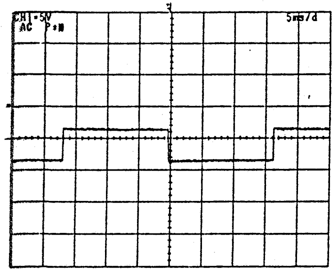
	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡	➡≫	➡⋙
PB	⇨	⇨≫	⇨⋙

- Signal path

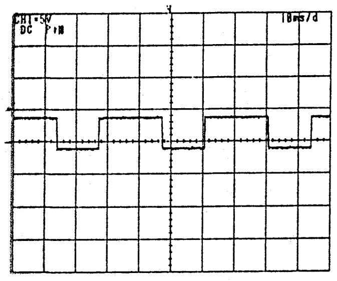
	REC
Ref. signal	➤

• Waveforms

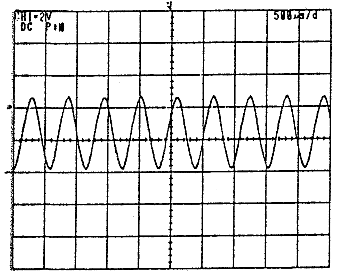
❶ IC201 ① REC/PB
5Vp-p (V)



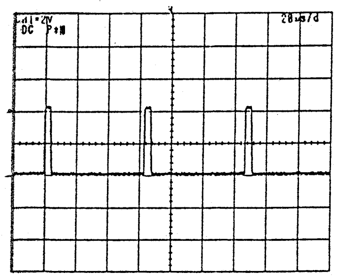
❷ IC201 ⑦ REC
5Vp-p (2V)



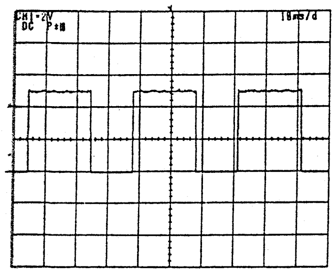
❸ IC201 ㊷ REC/PB
4.4Vp-p (16MHz)



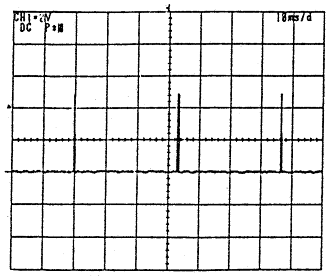
❹ IC201 (66) REC/PB
4Vp-p (H)



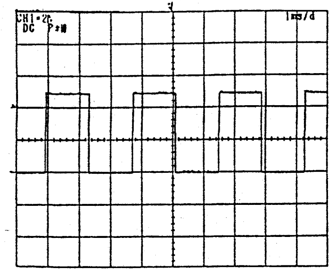
❺ IC201 (67) PB
5Vp-p (2V)



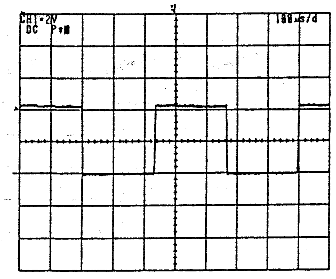
❻ IC201 (68) REC/PB
5Vp-p (2V)



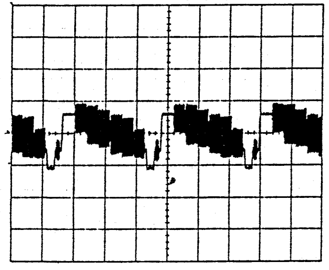
❼ IC201 (69) REC/PB
5Vp-p (360Hz)



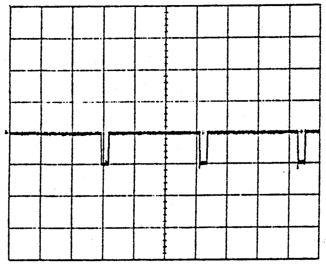
❽ IC201 (70) REC/PB
4.2Vp-p (2.16kHz)



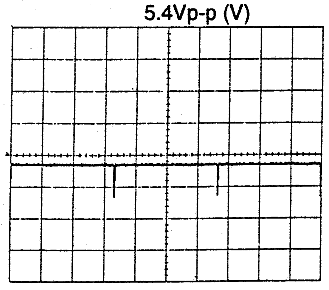
❾ IC401 ③ REC/PB
2.1Vp-p (H)



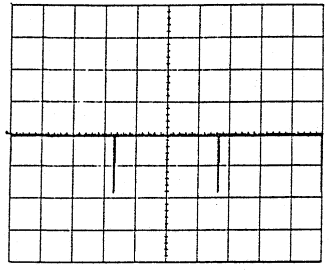
❿ C401 ⑩ REC/PB
6.8Vp-p (H)



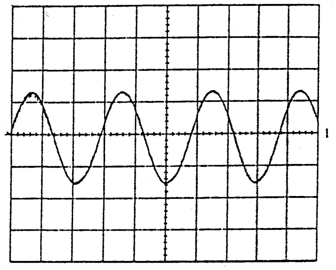
⓫IC401 ⑪ REC/PB
5.4Vp-p (V)



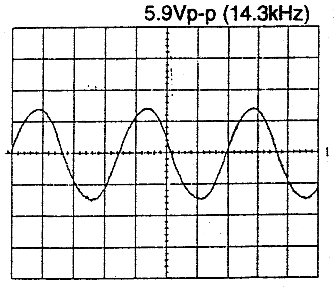
⓬ IC401 ⑬ REC/PB
3.7Vp-p (H)



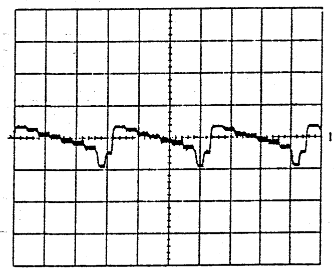
⓭ IC401 ⑮ REC/PB
5.8Vp-p (6.85MHz)



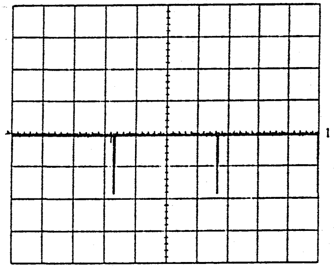
⓮ IC401 ⑧ REC/PB
5.9Vp-p (14.3kHz)



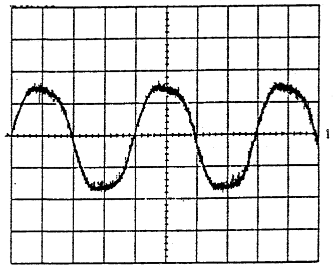
⓯ IC402 ② REC/PB
1.3Vp-p (H)



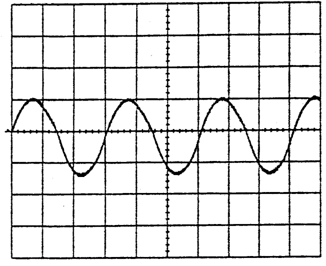
⓰ IC402 ⑤ REC/PB
3.7Vp-p (V)

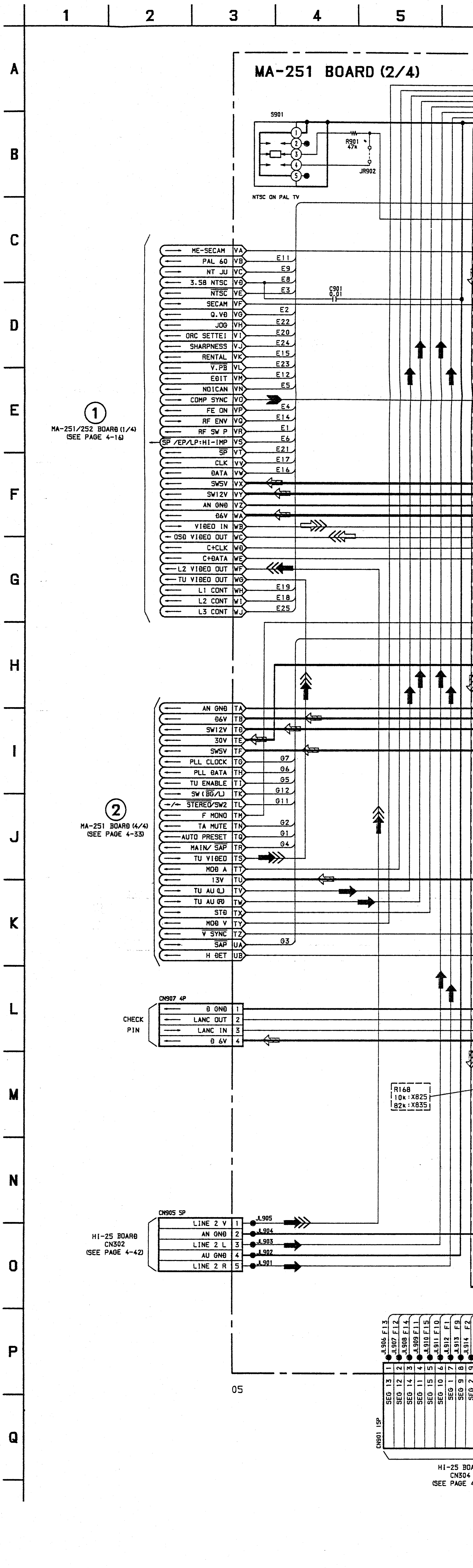


⓱ IC402 ⑩ REC/PB
700mV (500kHz)



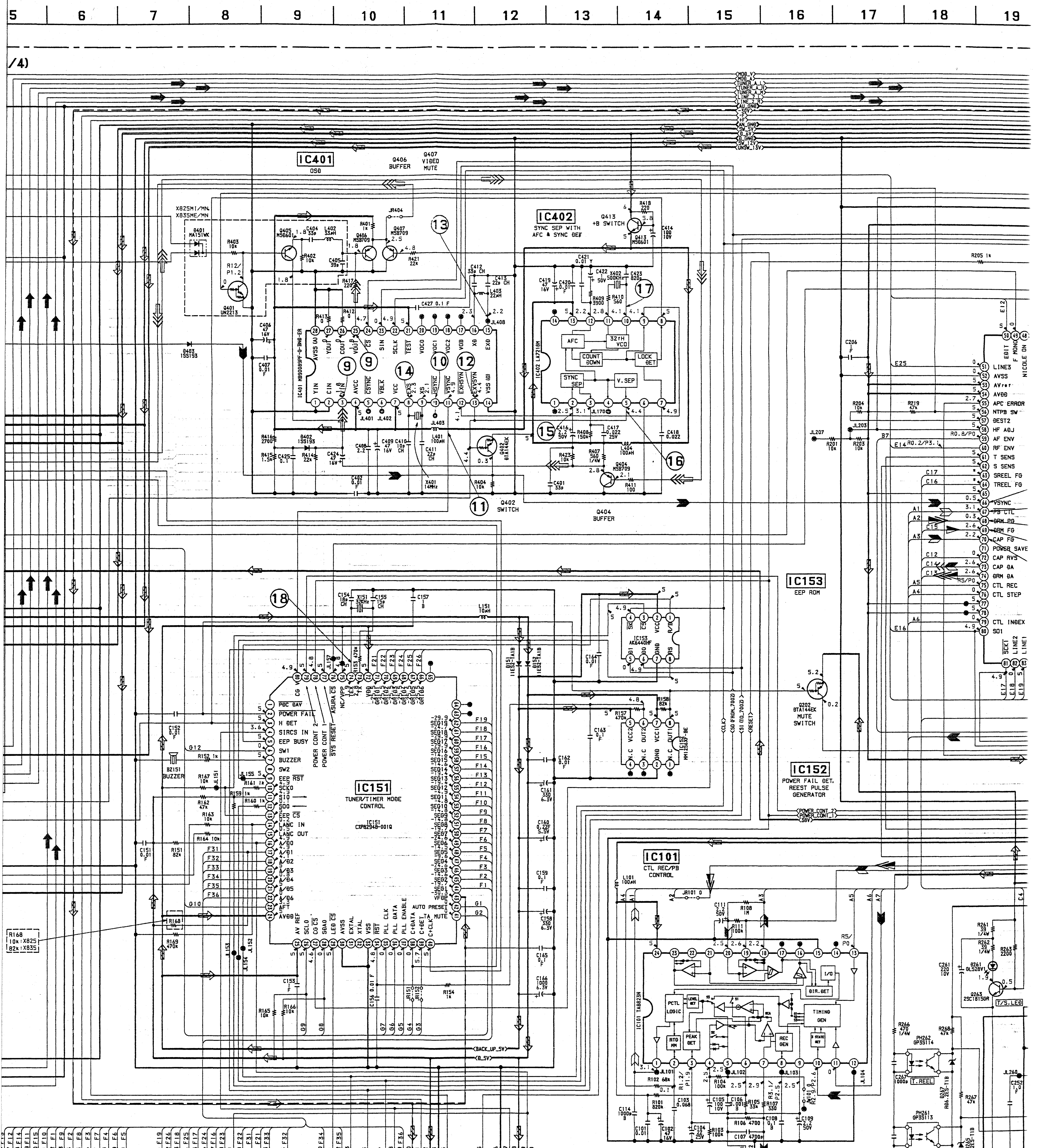
⓲ IC151 (74) REC/PB
2.5Vp-p (32kHz)





ROL), DC-70 (RELAY) (SLV-X825/X835) SCHEMATIC DIAGRAM

• See page 4-10 to 4-12 for printed wiring board.


5
6
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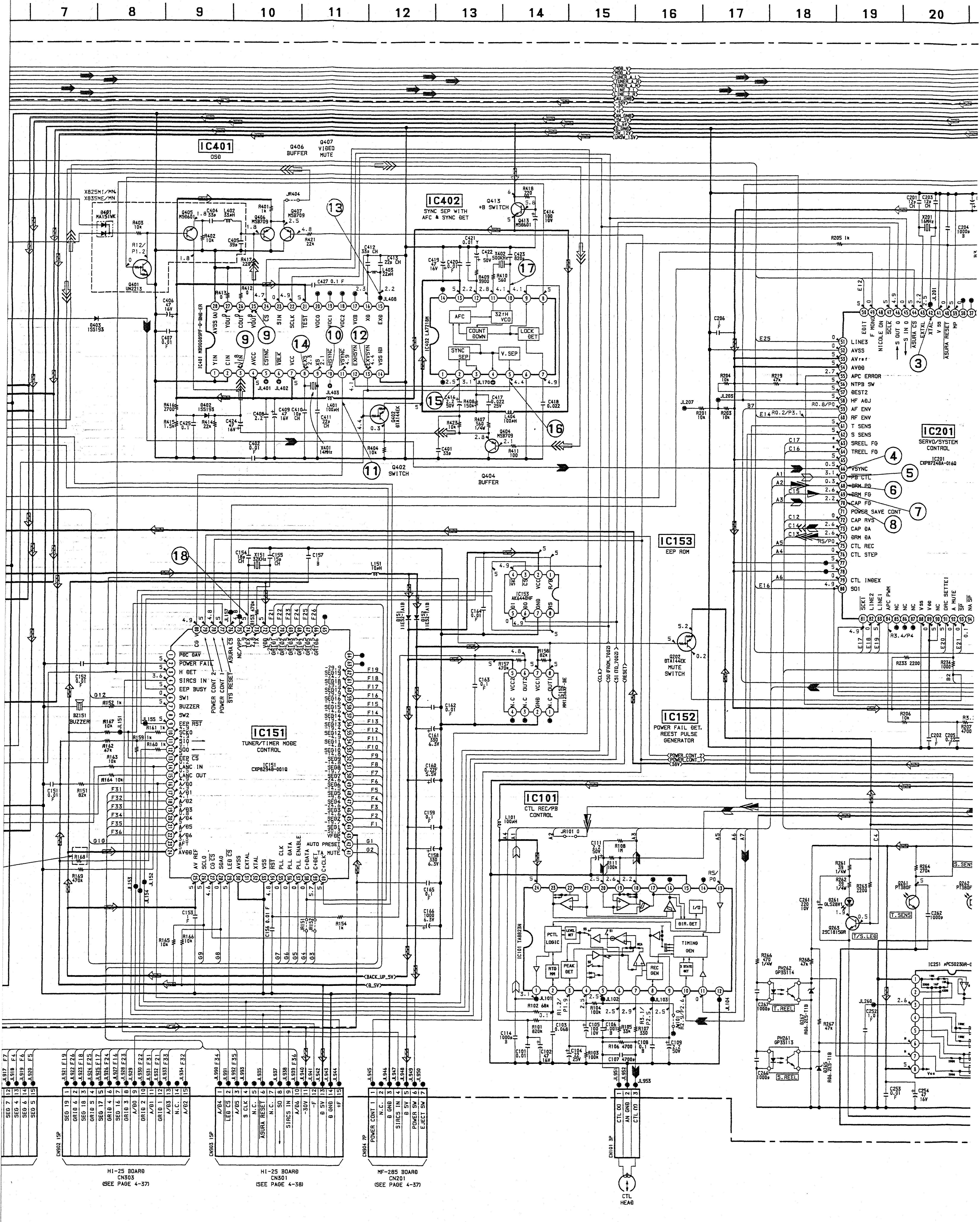
11
12
13
14
15
16
17
18
19
/4)
IC401
OSD
Q406
BUFFER
Q407
VIDEO
MUTE
IC402
SYNC SEP WITH
AFC & SYNC DET
Q413
+B SWITCH
X825MI/MN
X835ME/MN
Q401
UN2213
Q402
SWITCH
Q404
BUFFER
X401
14MHz
AFC
32fH
VCO
COUNT
DOWN
LOCK
DET
SYNC
SEP
V.SEP
IC151
TUNER/TIMER MODE
CONTROL
IC151
CXP82948-001Q
IC153
EEP ROM
IC153
AK6440HF
IC152
POWER FAIL DET,
REEST PULSE
GENERATOR
Q202
DTA144EK
MUTE
SWITCH
IC101
CTL REC/PB
CONTROL
PCTL
LOGIC
TIMING
GEN
REC
GEN
PEAK
DET
DIR.DET
I/O
BZ151
BUZZER
X151
32KHz
T.REEL
S.REEL
T/S.LED
R168
10k:X825
82k:X835
PDC DAV
POWER FAIL
H DET
SIRCS IN
EEP BUSY
SW1
BUZZER
SW2
EEP RST
SCKO
SIO
SOO
EEP CS
LANC IN
LANC OUT
AFT
AVDD
LINE3
AVSS
AVref
AVDD
APC ERROR
NTPB SW
DEST2
HF ADJ
AF ENV
RF ENV
T SENS
S SENS
SREEL FG
TREEL FG
VSYNC
PB CTL
DRM PG
DRM FG
CAP FG
POWER SAVE
CAP RVS
CAP DA
DRM DA
CTL REC
CTL STEP
CTL INDEX
SO1
HI-25 BOARD
CN304
(SEE PAGE 4-37)
HI-25 BOARD
CN303
(SEE PAGE 4-37)
HI-25 BOARD
CN301
(SEE PAGE 4-38)
MF-285 BOARD
CN201
(SEE PAGE 4-37)
CN902 15P
CN903 15P
CN904 7P
CN101 3P
CTL HEAD
CTL (X)
AN GND
CTL (Y)
POWER CONT 1
N.C.
D GND
SIRCS IN
D 5V
POWER SW
EJECT SW
BACK_UP_5V
B_5V
POWER_CONT_2
POWER_CONT_1
38V

ELAY) (SLV-X825/X835) SCHEMATIC DIAGRAM

• See page 4-10 to 4-12 for printed wiring board.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IC401
OSD
Q406 BUFFER
Q407 VIDEO MUTE
X825MI/MN, X835ME/MN
D401 MA151WK
Q401 UN2213
D403 1SS193
Q405 MSD601
Q406 MSB709
Q407 MSB709
IC401 MB90089PF-G-BND-ER
IC402
SYNC SEP WITH AFC & SYNC DET
Q413 +B SWITCH
IC402 LA7218M
AFC
32fH VCO
COUNT DOWN
LOCK DET
SYNC SEP
V. SEP
Q402 DTA144EK
Q402 SWITCH
Q404 MSB709
Q404 BUFFER
X401 14MHz
X402 500KHz
IC153
EEP ROM
IC153 AK6440HF
IC152 MM1125XF-BE
IC152
POWER FAIL DET, REEST PULSE GENERATOR
Q202 DTA144EK
MUTE SWITCH
IC151
TUNER/TIMER MODE CONTROL
IC151 CXP82948-001Q
X151 32KHz
BZ151 BUZZER
IC101
CTL REC/PB CONTROL
IC101 TA8823N
PCTL LOGIC
RTG MM
PEAK DET
REC GEN
TIMING GEN
DIR. DET
I/O
IC201
SERVO/SYSTEM CONTROL
IC201 CXP87248A-016Q
LINE3
AVSS
AVref
AVDD
APC ERROR
NTPB SW
DEST2
HF ADJ
AF ENV
RF ENV
T SENS
S SENS
SREEL FG
TREEL FG
VSYNC
PB CTL
DRM PG
DRM FG
CAP FG
POWER SAVE CONT
CAP RVS
CAP DA
DRM DA
CTL REC
CTL STEP
CTL INDEX
SO1
X201 16MHz
Q261 PT380F
Q262 PT380F
Q263 2SC1815GR
D261 GL528V1
T.SENS
S.SENS
T/S.LED
PH262 GP3S114
PH261 GP3S113
T.REEL
S.REEL
IC251 μPC5023GR-0
<BACK_UP_5V>
<B_5V>
<POWER_CONT_2>
<POWER_CONT_1>
<30V>
<CLK>
<SO (FROM 7602)>
<SI (TO 7602)>
<RESET>
CN902 15P
HI-25 BOARD CN303 (SEE PAGE 4-37)
CN903 15P
HI-25 BOARD CN301 (SEE PAGE 4-38)
CN904 7P
MF-285 BOARD CN201 (SEE PAGE 4-37)
CN101 3P
CTL DO
AN GND
CTL (Y)
CTL HEAD
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
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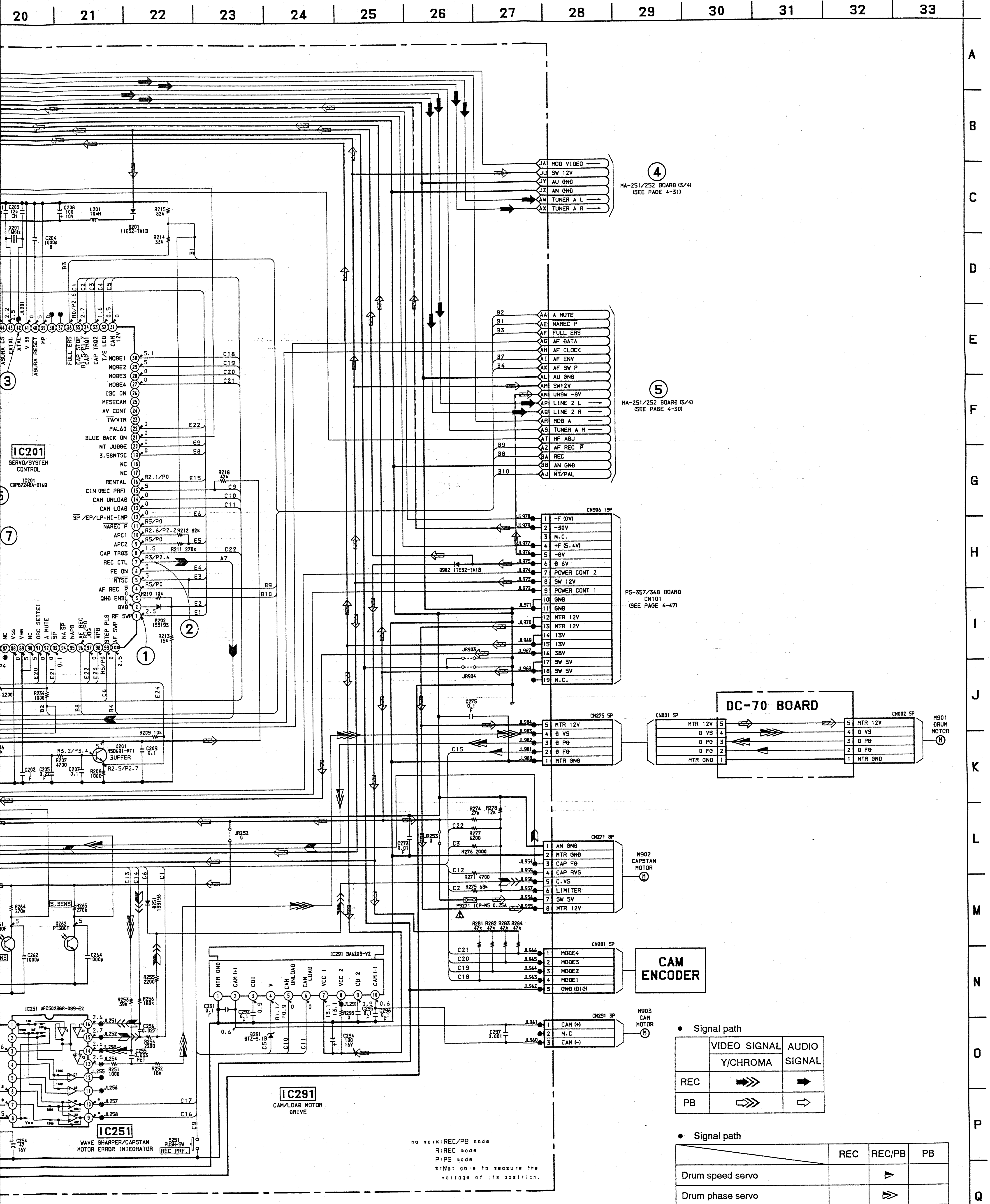
⑮
⑯
⑰
⑱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F
G
H
I
J
K
L
M
N
O
P
Q
IC201
SERVO/SYSTEM CONTROL
IC201 CXP87248A-016Q
MODE1
MODE2
MODE3
MODE4
CBC ON
MESECAM
AV CONT
TV/VTR
PAL60
BLUE BACK ON
NT JUDGE
3.58NTSC
NC
NC
RENTAL
CIN (REC PRF)
CAM UNLOAD
CAM LOAD
SP/EP/LP:HI-IMP
NAREC P
APC1
APC2
CAP TRQ3
REC CTL
FE ON
NTSC
AF REC
QHD ENBL
QVD
RF SWP
ASURA CS
EXTAL
XTAL
V SS
ASURA RESET
HP
FULL ERS
CAP STOP
CAP TRQ1
CAP TRQ2
T/E LED
CAM 12V
X201 16MHz
L201 10μH
D201 11ES2-TA1B
Q201 MSD601-RT1 BUFFER
D202 1SS193
①
②
③
④
⑤
⑦
MA-251/252 BOARD (3/4) (SEE PAGE 4-31)
MA-251/252 BOARD (3/4) (SEE PAGE 4-30)
MOD VIDEO
SW 12V
AU GND
AN GND
TUNER A L
TUNER A R
A MUTE
NAREC P
FULL ERS
AF DATA
AF CLOCK
AF ENV
AF SW P
AU GND
SW12V
UNSW -8V
LINE 2 L
LINE 2 R
MOD A
TUNER A M
HF ADJ
AF REC P
REC
AN GND
NT/PAL
CN906 19P
-F (0V)
-30V
N.C.
+F (5.4V)
-8V
D 6V
POWER CONT 2
SW 12V
POWER CONT 1
GND
GND
MTR 12V
MTR 12V
13V
13V
38V
SW 5V
SW 5V
N.C.
D902 11ES2-TA1B
PS-357/368 BOARD CN101 (SEE PAGE 4-47)
CN275 5P
MTR 12V
D VS
D PG
D FG
MTR GND
DC-70 BOARD
CN001 5P
CN002 5P
M901 DRUM MOTOR
CN271 8P
AN GND
MTR GND
CAP FG
CAP RVS
C.VS
LIMITER
SW 5V
MTR 12V
M902 CAPSTAN MOTOR
PS271 ICP-N5 0.25A
CN281 5P
MODE4
MODE3
MODE2
MODE1
GND (DIG)
CAM ENCODER
CN291 3P
CAM (+)
N.C
CAM (-)
M903 CAM MOTOR
IC291 BA6209-V2
MTR GND
CAM (+)
CD1
V
CAM UNLOAD
CAM LOAD
VCC 1
VCC 2
CD 2
CAM (-)
D291 DTZ-9.1B
IC291
CAM/LOAD MOTOR DRIVE
IC251 μPC5023GR-089-E2
IC251
WAVE SHARPER/CAPSTAN MOTOR ERROR INTEGRATOR
S251 PUSH-SW REC PRF.
S.SENS
Q262 PT380F
D251 1SS193
JR252
JR253
JR903
JR904

no mark:REC/PB mode
R:REC mode
P:PB mode
*:Not able to measure the voltage of its position.

- Signal path

	VIDEO SIGNAL Y/CHROMA	AUDIO SIGNAL
REC	➡≫	➡
PB	⇨≫	⇨

- Signal path

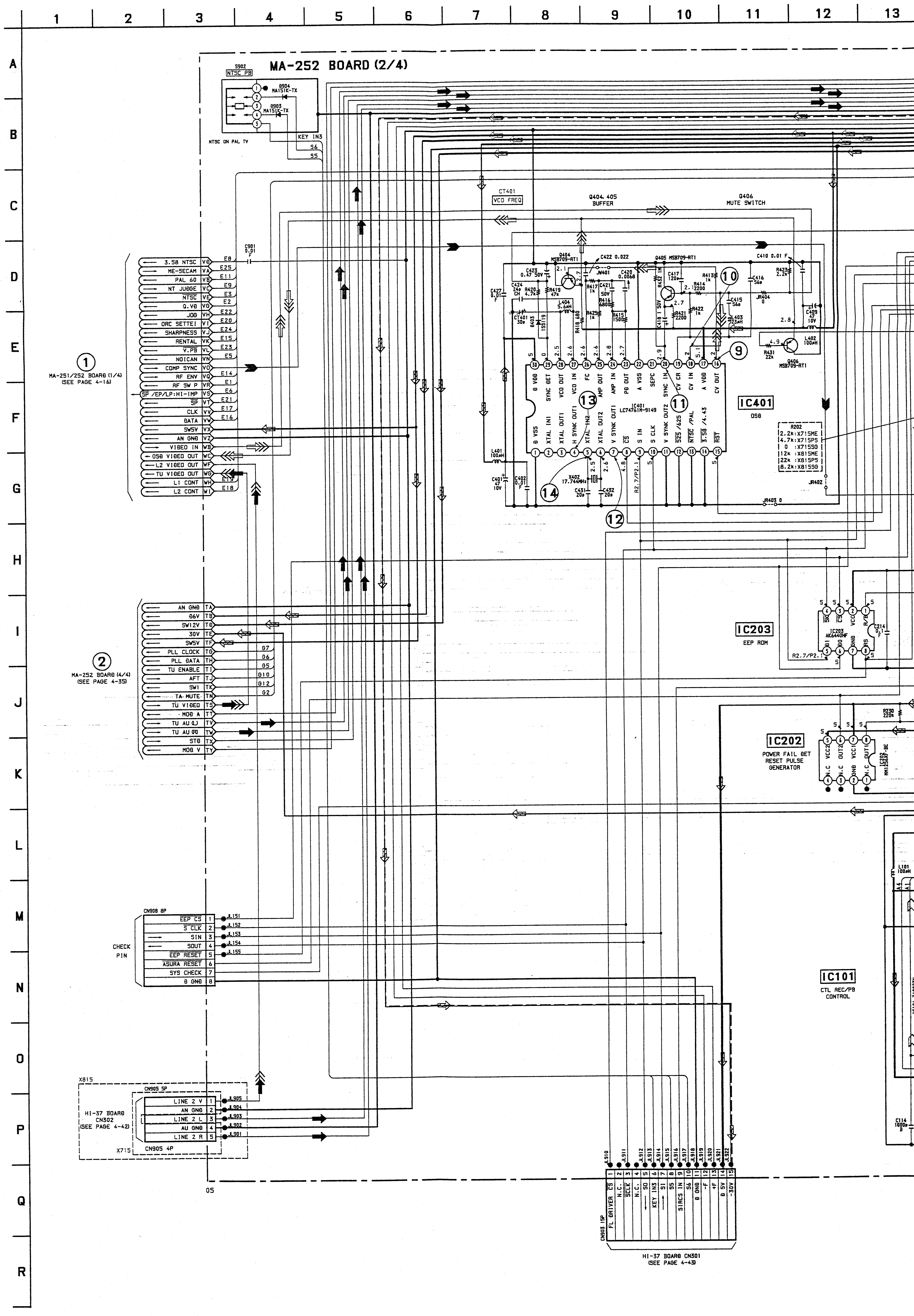
	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		⩥	
Drum servo (speed and phase)		⩥≫	
Capstan speed servo		⊐	
Capstan servo (speed and phase)		⊐≫	
Ref. signal	➤		▷

SERVO/SYSTEM/TUNER/TIMER/MODE CONTROL
MA-251, DC-70

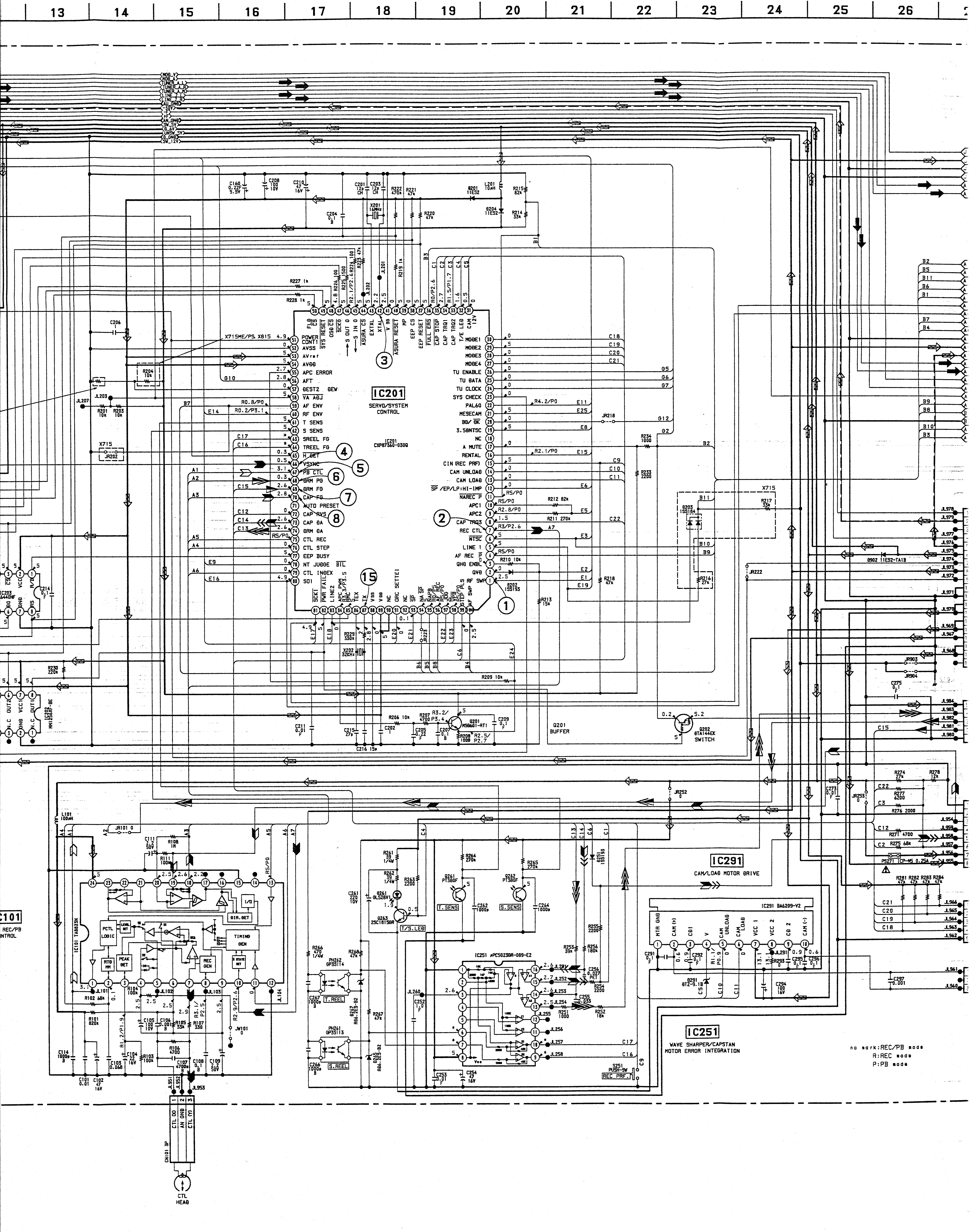
MA-252 (SERVO/SYSTEM CONTROL), DC-78 (RELAY) (SLV-X715/X815) SCHEMATIC DIAGRAM

– Ref. No.: MA-252 Board; 4,000 series, DC-78 Board; 1,000 series –

• **See page 4-13 to 4-15 for printed wiring board.**



MA-252 BOARD (2/4)
S902 NTSC PB
D904 MA151K-TX
D903 MA151K-TX
NTSC ON PAL TV
KEY IN3
S6
S5
CT401 VCO FREQ
Q404, 405 BUFFER
Q406 MUTE SWITCH
① MA-251/252 BOARD (1/4) (SEE PAGE 4-16)
3.58 NTSC
ME-SECAM
PAL 60
NT JUDGE
NTSC
D.V8
JOG
DRC SETTEI
SHARPNESS
RENTAL
V.PB
NOICAN
COMP SYNC
RF ENV
RF SW P
SP /EP/LP:HI-IMP
SP
CLK
DATA
SWSV
AN GND
VIDEO IN
OSD VIDEO OUT
L2 VIDEO OUT
TU VIDEO OUT
L1 CONT
L2 CONT
IC401 LC74761M-9149
IC401 OSD
X402 17.744MHz
R202 2.2k:X715ME 4.7k:X715PS 0 :X715SG 12k :X815ME 22k :X815PS 8.2k:X815SG
IC203 EEP ROM
IC203 AK6440HF
IC202 POWER FAIL DET RESET PULSE GENERATOR
IC101 CTL REC/PB CONTROL
② MA-252 BOARD (4/4) (SEE PAGE 4-35)
AN GND
D6V
SW12V
30V
SWSV
PLL CLOCK
PLL DATA
TU ENABLE
AFT
SW1
TA MUTE
TU VIDEO
MOD A
TU AU (L)
TU AU (R)
STD
MOD V
CHECK PIN
CN908 8P
EEP CS
S CLK
SIN
SOUT
EEP RESET
ASURA RESET
SYS CHECK
D GND
X815
CN905 5P
HI-37 BOARD CN302 (SEE PAGE 4-42)
LINE 2 V
AN GND
LINE 2 L
AU GND
LINE 2 R
X715
CN905 4P
CN903 15P
FL DRIVER CS
N.C
SCLK
SO
KEY IN3
S1
S5
SIRCS IN
S6
D GND
-F
+F
D 5V
-30V
HI-37 BOARD CN301 (SEE PAGE 4-43)


13
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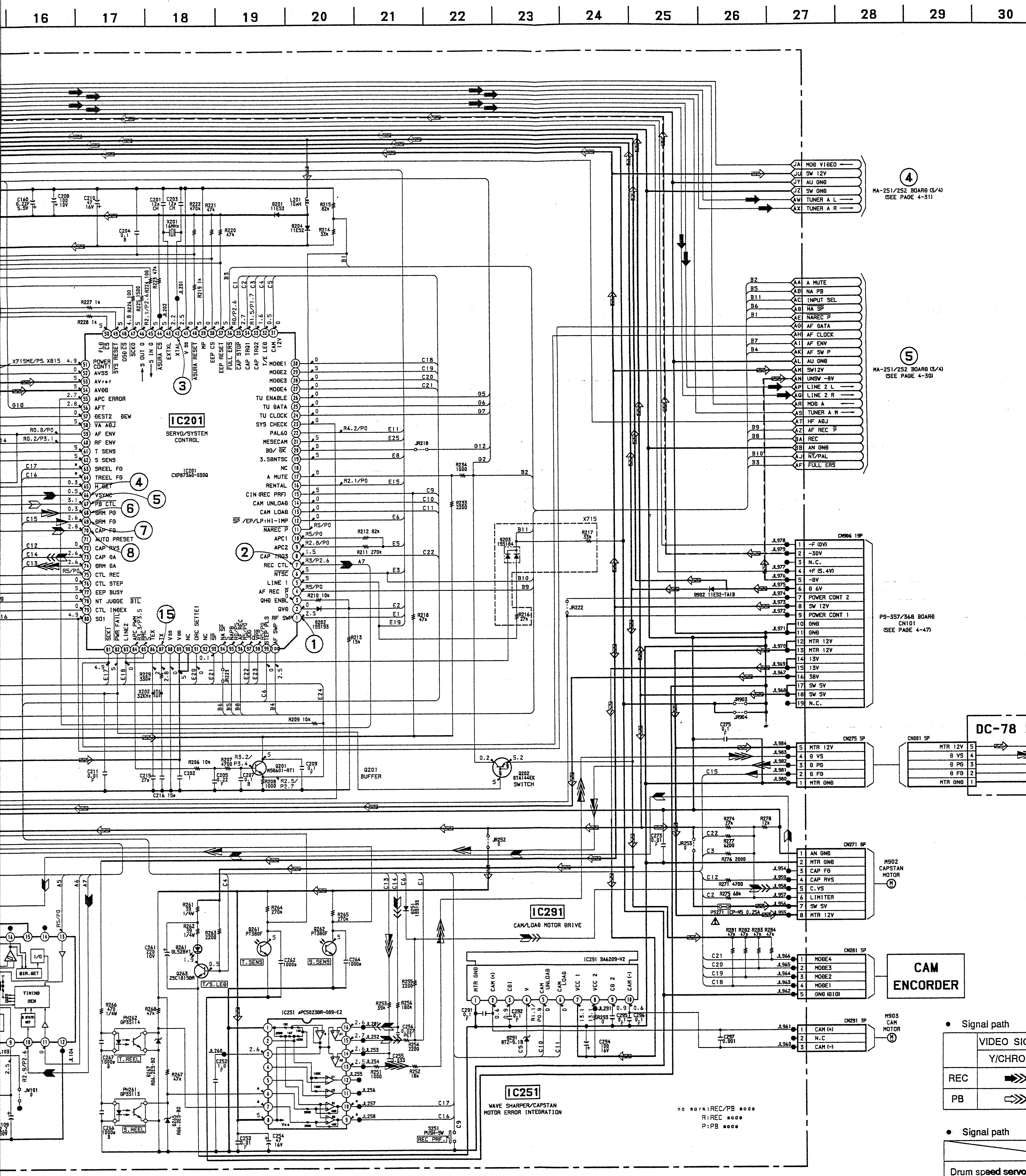
26
IC201
SERVO/SYSTEM CONTROL
IC201 CXP87360-030Q
X201 16MHz
X202 32KHz
X715ME/PS. X815
POWER CONT
AVSS
AVref
AVDD
APC ERROR
AFT
DEST2
VA ADJ
AF ENV
RF ENV
T SENS
S SENS
SREEL FG
TREEL FG
H DET
VSYNC
PB CTL
DRM PG
DRM FG
CAP FG
AUTO PRESET
CAP RVS
CAP DA
DRM DA
CTL REC
CTL STEP
EEP BUSY
NT JUDGE
CTL INDEX
SO1
MODE1
MODE2
MODE3
MODE4
TU ENABLE
TU DATA
TU CLOCK
SYS CHECK
PAL60
MESECAM
BG/DK
3.58NTSC
NC
A MUTE
RENTAL
CIN (REC PRF)
CAM UNLOAD
CAM LOAD
SP/EP/LP:HI-IMP
NAREC P
APC1
APC2
CAP TRQ3
REC CTL
NTSC
LINE 1
AF REC
DHD ENBL
QVD
RF SWP
Q201 BUFFER
Q202 DTA144EK SWITCH
Q201 MSD601-RT1
IC291
CAM/LOAD MOTOR DRIVE
IC291 BA6209-V2
MTR GND
CAM (+)
CD1
V
CAM UNLOAD
CAM LOAD
VCC 1
VCC 2
CD 2
CAM (-)
IC251
WAVE SHAPER/CAPSTAN MOTOR ERROR INTEGRATION
IC251 μPC5023GA-089-E2
T.SENS
S.SENS
T/S.LED
T.REEL
S.REEL
Q261 PT380F
Q262 PT380F
Q263 2SC1815GR
PH261 GP3S113
PH262 GP3S114
S251 PUSH-SW
REC PRF.
PS271 ICP-N5 0.25A
IC101
REC/PB
CONTROL
IC101 TA8823N
PCTL LOGIC
LEVEL DET
RTG MM
PEAK DET
TIMING GEN
REC GEN
DIR.DET
CN101 3P
CTL DD
AN GND
CTL (Y)
CTL HEAD
no mark:REC/PB mode
R:REC mode
P:PB mode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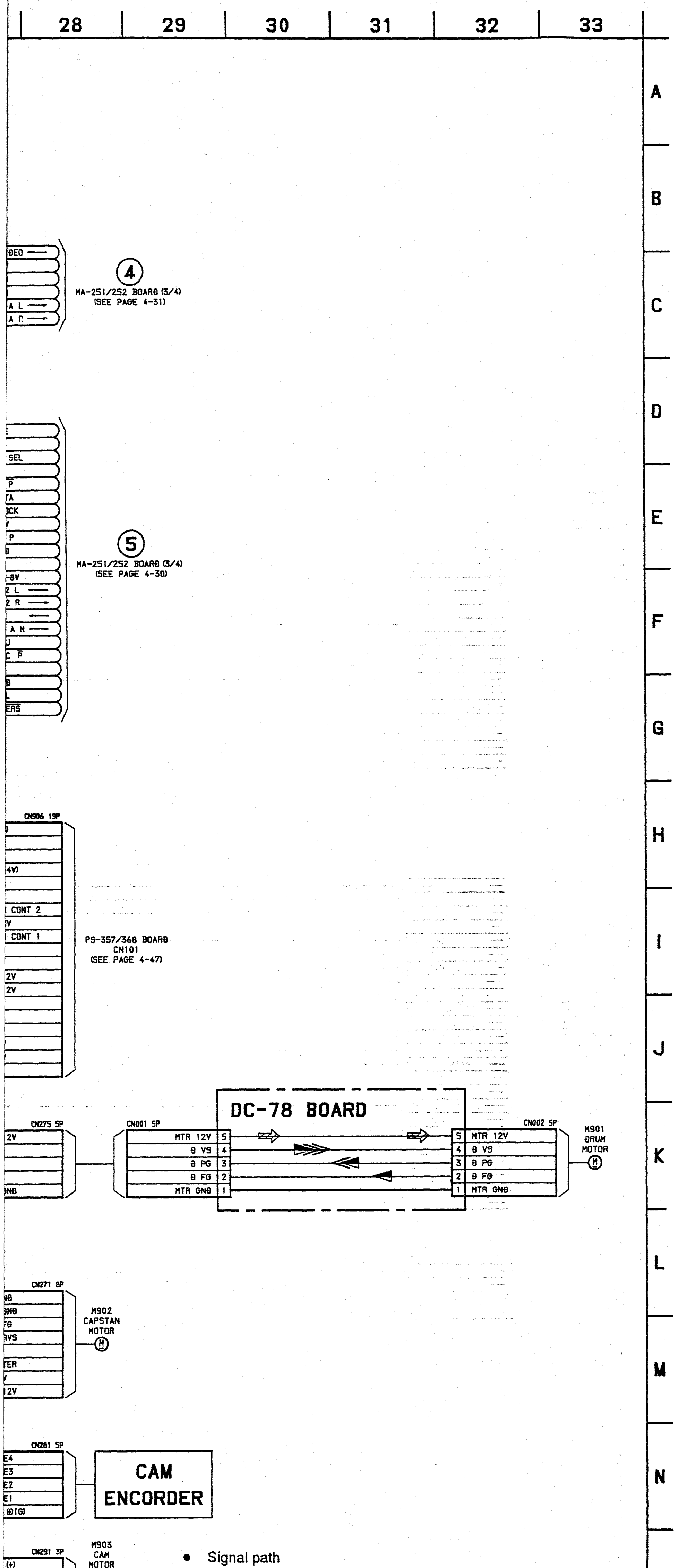
IC201
SERVO/SYSTEM CONTROL
IC201 CXP87360-030Q
IC291
CAM/LOAD MOTOR DRIVE
IC291 BA6209-V2
IC251
WAVE SHARPER/CAPSTAN MOTOR ERROR INTEGRATION
IC251 μPC5023OR-089-E2
MA-251/252 BOARD (3/4) (SEE PAGE 4-31)
MA-251/252 BOARD (3/4) (SEE PAGE 4-30)
PS-357/368 BOARD CN101 (SEE PAGE 4-47)
CN906 19P
CN275 5P
CN271 8P
CN281 5P
CN291 3P
DC-78
CN001 5P
M902 CAPSTAN MOTOR
M903 CAM MOTOR
CAM ENCORDER
MOD VIDEO
SW 12V
AU GND
SW GND
TUNER A L
TUNER A R
A MUTE
NA PB
INPUT SEL
NA SP
NAREC P
AF DATA
AF CLOCK
AF ENV
AF SW P
AU GND
SW12V
UNSW -8V
LINE 2 L
LINE 2 R
MOD A
TUNER A M
HF ADJ
AF REC P
REC
AN GND
NT/PAL
FULL ERS
-F (0V)
-30V
N.C.
+F (5.4V)
-8V
D 6V
POWER CONT 2
SW 12V
POWER CONT 1
GND
GND
MTR 12V
MTR 12V
13V
13V
38V
SW 5V
SW 5V
N.C.
MTR 12V
D VS
D PG
D FG
MTR GND
AN GND
MTR GND
CAP FG
CAP RVS
C.VS
LIMITER
SW 5V
MTR 12V
MODE4
MODE3
MODE2
MODE1
GND (DIG)
CAM (+)
N.C
CAM (-)
Q201 BUFFER
Q202 DTA144EK SWITCH
T.SENS
S.SENS
T/S.LED
T.REEL
S.REEL
S251 PUSH-SW REC PRF.
PS271 ICP-N5 0.25A
no mark:REC/PB mode
R:REC mode
P:PB mode
①
②
③
④
⑤
⑥
⑦
⑧
⑮

- Signal path

	VIDEO SIG
	Y/CHRO
REC	➡≫
PB	⇨≫

- Signal path

Drum speed servo
Drum phase servo
Drum servo (spee
Capstan speed se
Capstan servo (sp
Ref. signal


28
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A
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I
J
K
L
M
N
O
P
Q
R
④
MA-251/252 BOARD (3/4)
(SEE PAGE 4-31)
⑤
MA-251/252 BOARD (3/4)
(SEE PAGE 4-30)
CN906 19P
PS-357/368 BOARD
CN101
(SEE PAGE 4-47)
DC-78 BOARD
CN275 5P
CN001 5P
MTR 12V
θ VS
θ PG
θ FG
MTR GND
CN002 5P
M901
DRUM
MOTOR
CN271 8P
M902
CAPSTAN
MOTOR
CN281 5P
CAM
ENCORDER
CN291 3P
M903
CAM
MOTOR

- Signal path

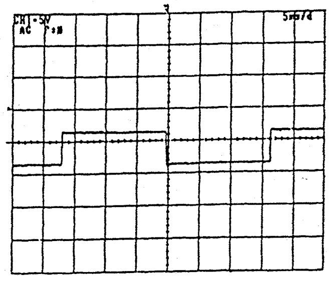
	VIDEO SIGNAL	AUDIO
	Y/CHROMA	SIGNAL
REC	➡≫	➡
PB	⇨≫	⇨

- Signal path

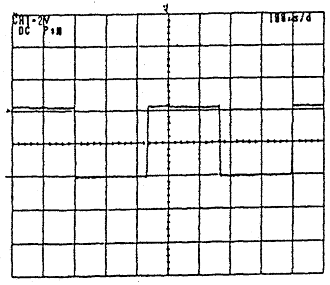
	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		≫	
Drum servo (speed and phase)		▷≫	
Capstan speed servo		⊐	
Capstan servo (speed and phase)		⊐≫	
Ref. signal	➡		⊃

• Waveforms

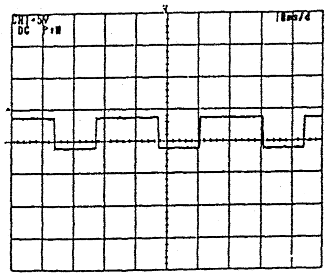
❶ IC201 ① REC/PB 5Vp-p (V)



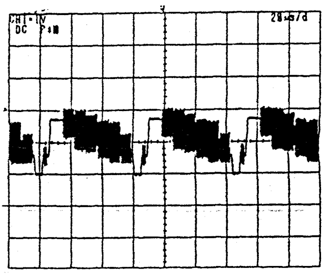
❽ IC201 ⑩ REC/PB 4.2Vp-p (2.16kHz)



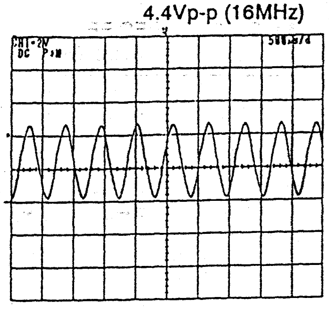
❷ IC201 ⑦ REC 5Vp-p (2V)



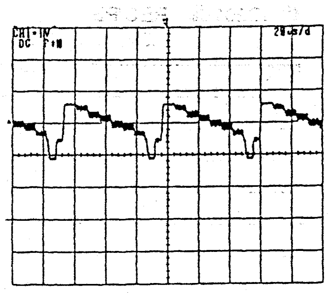
❾, ❿ IC401 ⑯, ⑱ REC/PB 2Vp-p (H)



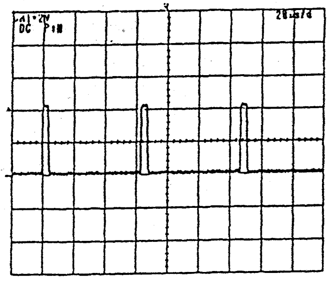
❸ IC201 ㊷ REC/PB 4.4Vp-p (16MHz)



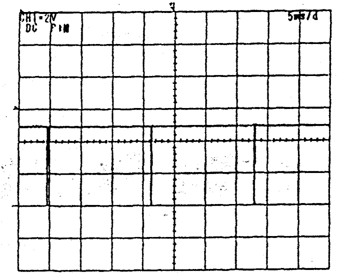
⓫ IC401 ⑳ 1.8Vp-p (H)



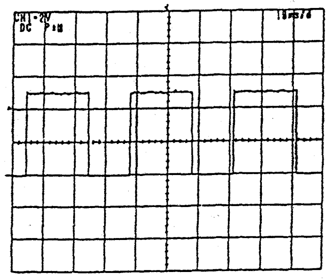
❹ IC201 ㊻ REC/PB 4Vp-p (H)



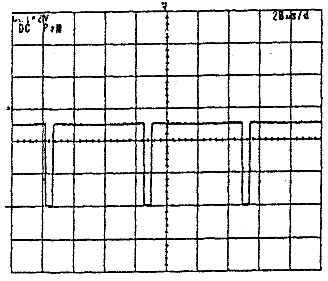
⓬ IC401 ⑦ REC/PB 5Vp-p (V)



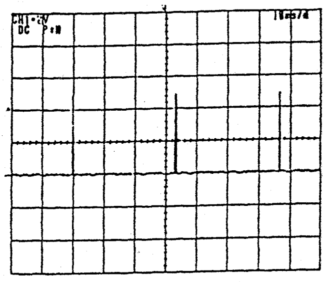
❺ IC201 (67) PB 5Vp-p (2V)



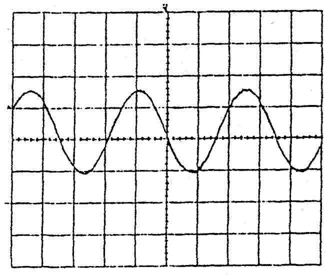
⓭ IC401 ④ REC/PB 5Vp-p (H)



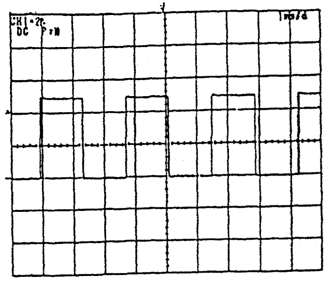
❻ IC201 (68) REC/PB 5Vp-p (2V)



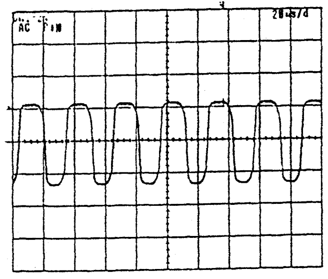
⓮ IC401 ⑤ REC/PB 2Vp-p (17.7MHz)



❼ IC201 (69) REC/PB 5Vp-p (360Hz)

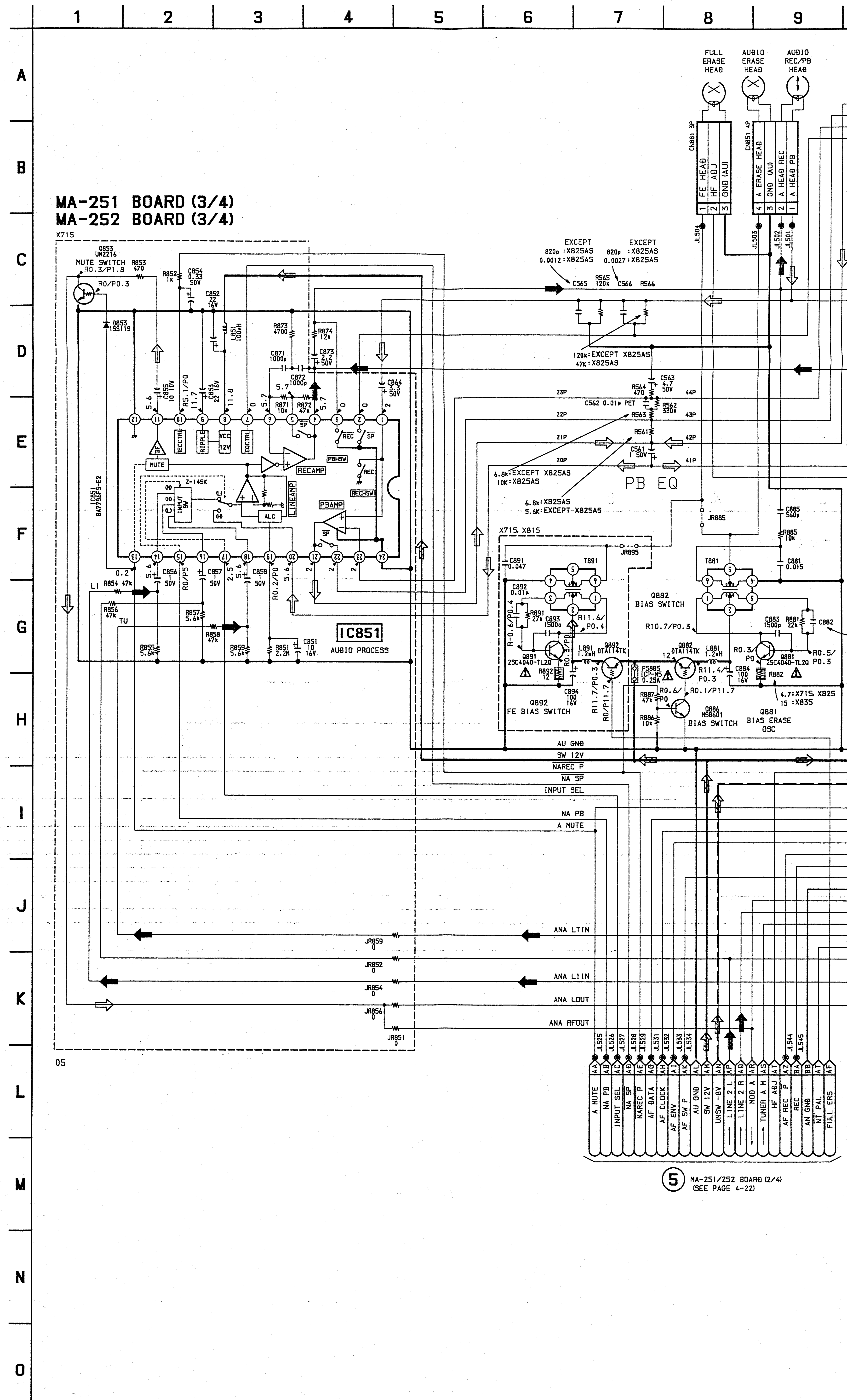


⓯ IC201 (67) REC/PB 5.3Vp-p (32kHz)

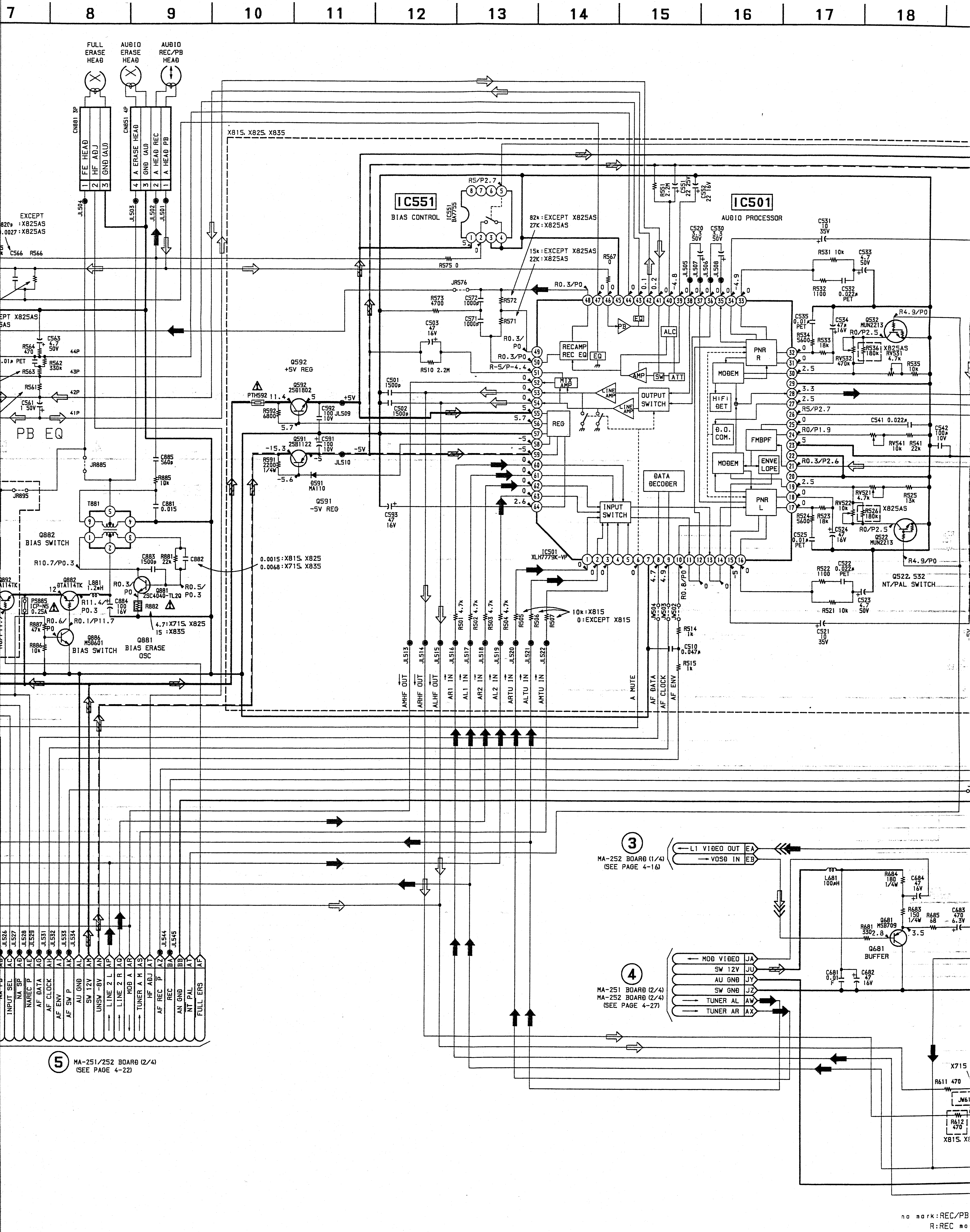


MA-251/252 (AUDIO, IO) SCHEMATIC DIAGRAM • See page 4-10 to 4-15 for printed wiring board.

– Ref. No.: MA-251 Board; 3,000 series, MA-252 Board; 4,000 Series –



1 2 3 4 5 6 7 8 9
A B C D E F G H I J K L M N O
MA-251 BOARD (3/4)
MA-252 BOARD (3/4)
X715
Q853 UN2216 MUTE SWITCH
R853 470
R0.3/P1.8
R0/P0.3
D853 1SS119
R852 1k
C854 0.33 50V
C852 22 16V
L851 100μH
R873 4700
R874 12k
C871 1000p
C873 2.2 50V
C872 1000p
R871 10k
R872 47k
C855 10 10V
C853 22 16V
C864 3.3 50V
R5.1/P0
11.7
11.8
5.6
5.7
IC851 BA7796FS-E2
MUTE
BF
RECCTRL
RIPPLE
VCC 12V
EQCTRL
RECAMP
LINEAMP
PBHSW
REC
SP
RECHSW
PBAMP
ALC
INPUT SW
Z=145K
C856 50V
C857 50V
C858 50V
R0/P5
R0.2/P0
0.2
L1
R854 47k
R856 47k
TU
R857 5.6k
R858 47k
R855 5.6k
R859 5.6k
R851 2.2M
C851 10 16V
IC851
AUDIO PROCESS
FULL ERASE HEAD
AUDIO ERASE HEAD
AUDIO REC/PB HEAD
CN881 3P
1 FE HEAD
2 HF ADJ
3 GND (AU)
CN851 4P
4 A ERASE HEAD
3 GND (AU)
2 A HEAD REC
1 A HEAD PB
JL504
JL503
JL502
JL501
EXCEPT 820p :X825AS 0.0012 :X825AS
EXCEPT 820p :X825AS 0.0027 :X825AS
C565
R565 120k
C566
R566
120k: EXCEPT X825AS 47K: X825AS
R564 470
C563 4.7 50V
C562 0.01μ PET
R562 330k
R563
R561
C561 1 50V
23P 22P 21P 20P
44P 43P 42P 41P
6.8k: EXCEPT X825AS 10K: X825AS
6.8k: X825AS 5.6k: EXCEPT X825AS
PB EQ
X715, X815
JR895
JR885
C885 560p
R885 10k
C891 0.047
T891
C892 0.01μ
R891 27k
C893 1500p
R-0.6/P0.4
R11.6/P0.4
Q891 2SC4040-TL2Q
R892 12
L891 1.2mH
Q892 DTA114TK
R0.3/P0
C894 100 16V
R11.7/P0.3
R0/P11.7
Q892 FE BIAS SWITCH
PS885 ICP-N5 0.25A
Q882 BIAS SWITCH
R10.7/P0.3
T881
C881 0.015
C883 1500p
R881 22k
C882
Q882 DTA114TK
L881 1.2mH
R0.3/P0
R0.5/P0.3
Q881 2SC4040-TL2Q
R11.4/P0.3
C884 100 16V
R882
R0.6/ R0.1/P11.7
R887 47k
R886 10k
Q886 MSB601
BIAS SWITCH
4.7: X715, X825 15: X835
Q881 BIAS ERASE OSC
AU GND
SW 12V
NAREC P
NA SP
INPUT SEL
NA PB
A MUTE
ANA LTIN
JR859 0
JR852 0
ANA LIIN
JR854 0
ANA LOUT
JR856 0
ANA RFOUT
JR851 0
05
JL525 JL526 JL527 JL528 JL529 JL531 JL532 JL533 JL534 JL544 JL545
AA A MUTE
AB NA PB
AC INPUT SEL
AD NA SP
AE NAREC P
AG AF DATA
AH AF CLOCK
AI AF ENV
AK AF SW P
AL AU GND
AM SW 12V
AN UNSW -8V
AO LINE 2 L
AQ LINE 2 R
AR MOD A
AS TUNER A M
AT HF ADJ
AZ AF REC P
BA REC
BB AN GND
AT NT PAL
AF FULL ERS
⑤ MA-251/252 BOARD (2/4) (SEE PAGE 4-22)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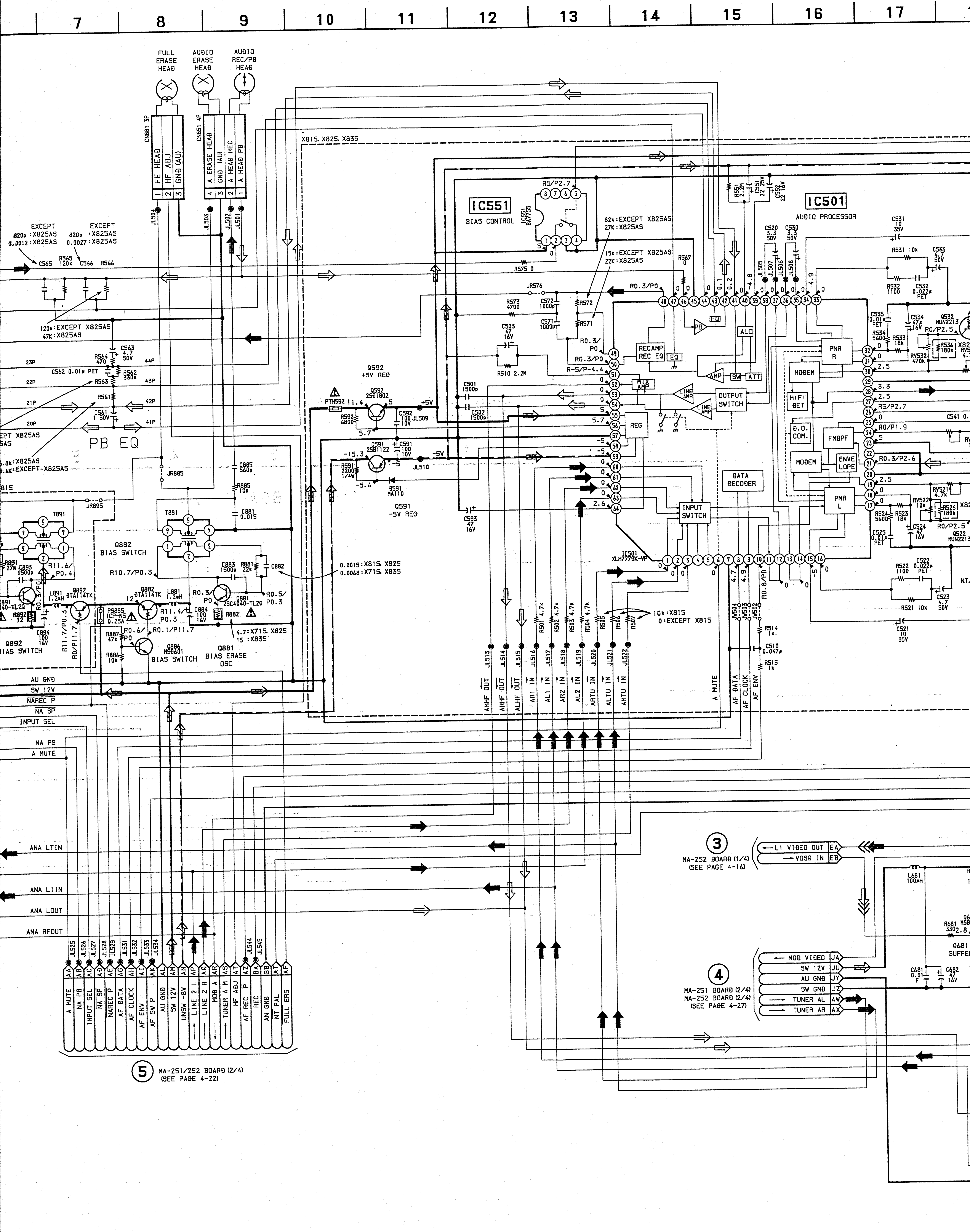
18
FULL ERASE HEAD
AUDIO ERASE HEAD
AUDIO REC/PB HEAD
CN881 3P
CN851 4P
FE HEAD
HF ADJ
GND (AU)
A ERASE HEAD
GND (AU)
A HEAD REC
A HEAD PB
X815, X825, X835
IC551
BIAS CONTROL
IC551 BA7755
IC501
AUDIO PROCESSOR
IC501 XLH7779K-VP
82k:EXCEPT X825AS
27K:X825AS
15k:EXCEPT X825AS
22K:X825AS
RECAMP REC EQ
EQ
ALC
AMP
SW
ATT
MIX AMP
LINE AMP
OUTPUT SWITCH
REG
INPUT SWITCH
DATA DECODER
PNR R
PNR L
MODEM
HIFI DET
D.O. COM.
FMBPF
ENVE LOPE
Q592 +5V REG
Q592 2SD1802
Q591 2SB1122
Q591 -5V REG
D591 MA110
PTH592
Q532 MUN2213
Q522 MUN2213
Q522, 532 NT/PAL SWITCH
T881
Q882 BIAS SWITCH
Q881 2SC4040-TL2Q
Q881 BIAS ERASE OSC
Q886 M58601
BIAS SWITCH
0.0015:X815, X825
0.0068:X715, X835
4.7:X715, X825
15 :X835
10k:X815
0:EXCEPT X815
PB EQ
AMHF OUT
ARHF OUT
ALHF OUT
AR1 IN
AL1 IN
AR2 IN
AL2 IN
ARTU IN
ALTU IN
AMTU IN
A MUTE
AF DATA
AF CLOCK
AF ENV
MA-252 BOARD (1/4)
(SEE PAGE 4-16)
L1 VIDEO OUT
VOSD IN
MA-251 BOARD (2/4)
MA-252 BOARD (2/4)
(SEE PAGE 4-27)
MOD VIDEO
SW 12V
AU GND
SW GND
TUNER AL
TUNER AR
Q681 M5B709
Q681 BUFFER
MA-251/252 BOARD (2/4)
(SEE PAGE 4-22)
INPUT SEL
NA SP
NAREC P
AF DATA
AF CLOCK
AF ENV
AF SW P
AU GND
SW 12V
UNSW -8V
LINE 2 L
LINE 2 R
MOD A
TUNER A M
HF ADJ
AF REC P
REC
AN GND
NT PAL
FULL ERS

no mark:REC/PB
R:REC mo
P:PB mod

ng board.



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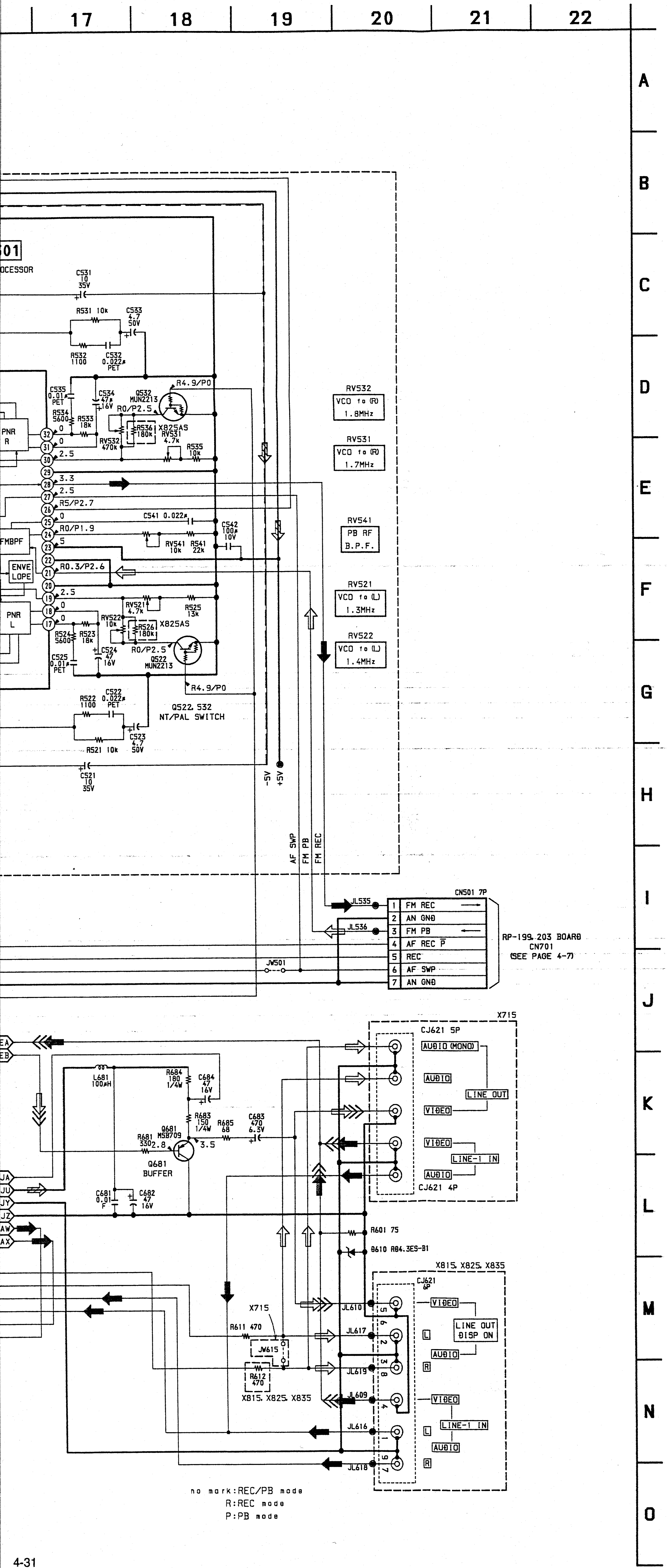
16
17
FULL ERASE HEAD
AUDIO ERASE HEAD
AUDIO REC/PB HEAD
CN881 3P
1 FE HEAD
2 HF ADJ
3 GND (AU)
CN851 4P
4 A ERASE HEAD
3 GND (AU)
2 A HEAD REC
1 A HEAD PB
X815, X825, X835
IC551
BIAS CONTROL
IC551 BA7755
R5/P2.7
82k:EXCEPT X825AS
27K:X825AS
15k:EXCEPT X825AS
22K:X825AS
IC501
AUDIO PROCESSOR
IC501 XLH7779K-VP
RECAMP REC EQ
EQ
MIX AMP
LINE AMP
OUTPUT SWITCH
REG
ALC
AMP
SW
ATT
PB
INPUT SWITCH
DATA DECODER
PNR R
PNR L
MODEM
HIFI DET
D.O. COM.
FMBPF
ENVE LOPE
Q592 +5V REG
Q592 2SD1802
Q591 2SB1122
Q591 -5V REG
D591 MA110
PTH592
Q882 BIAS SWITCH
Q892 BIAS SWITCH
Q886 MSD601 BIAS SWITCH
Q881 2SC4040-TL2Q
Q881 BIAS ERASE OSC
T881
T891
PB EQ
EXCEPT 820p :X825AS 0.0012:X825AS
EXCEPT 820p :X825AS 0.0027:X825AS
120k:EXCEPT X825AS
47K:X825AS
0.0015:X815, X825
0.0068:X715, X835
4.7:X715, X825
15 :X835
10k:X815
0:EXCEPT X815
AU GND
SW 12V
NAREC P
NA SP
INPUT SEL
NA PB
A MUTE
ANA LTIN
ANA L1IN
ANA LOUT
ANA RFOUT
AMHF OUT
ARHF OUT
ALHF OUT
AR1 IN
AL1 IN
AR2 IN
AL2 IN
ARTU IN
ALTU IN
AMTU IN
A MUTE
AF DATA
AF CLOCK
AF ENV
A MUTE
NA PB
INPUT SEL
NA SP
NAREC P
AF DATA
AF CLOCK
AF ENV
AF SW P
AU GND
SW 12V
UNSW -8V
LINE 2 L
LINE 2 R
MOD A M
TUNER A M
HF ADJ
AF REC P
REC
AN GND
NT PAL
FULL ERS
⑤ MA-251/252 BOARD (2/4) (SEE PAGE 4-22)
③ MA-252 BOARD (1/4) (SEE PAGE 4-16)
L1 VIDEO OUT
VOSD IN
④ MA-251 BOARD (2/4) MA-252 BOARD (2/4) (SEE PAGE 4-27)
MOD VIDEO
SW 12V
AU GND
SW GND
TUNER AL
TUNER AR
L681 100μH
Q681 BUFFER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22
A
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C
D
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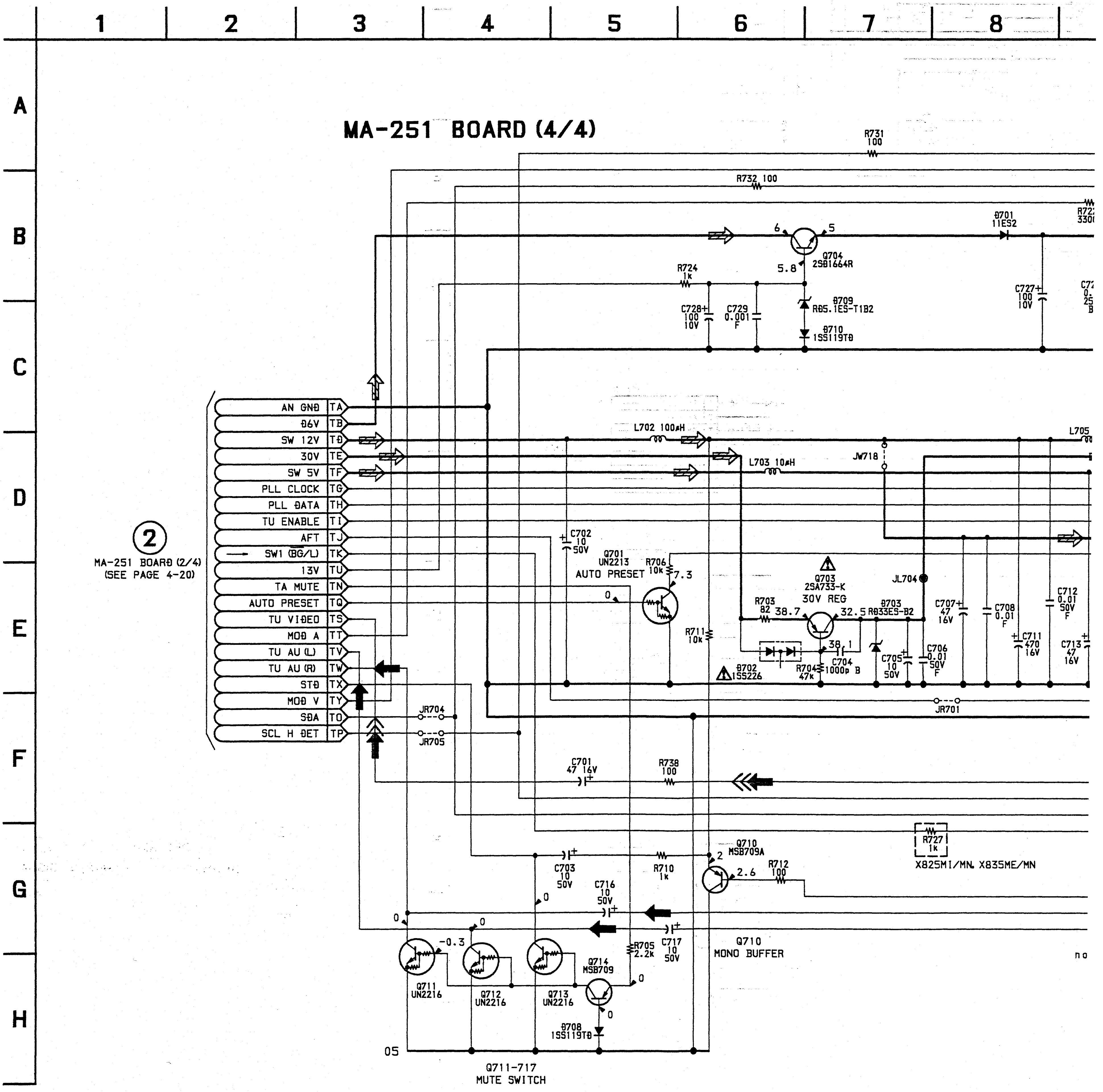
H
I
J
K
L
M
N
O
01
OCESSOR
C531 10 35V
R531 10k
C533 4.7 50V
R532 1100
C532 0.022μ PET
C535 0.01μ PET
C534 47μ 16V
Q532 MUN2213
R4.9/P0
R0/P2.5
R534 5600
R533 18k
R536 180k
X825AS
RV531 4.7k
RV532 470k
R535 10k
PNR R
3.3
2.5
R5/P2.7
C541 0.022μ
C542 100μ 10V
R0/P1.9
FMBPF
RV541 10k
R541 22k
ENVE LOPE
R0.3/P2.6
RV521 4.7k
R525 13k
RV522 10k
R526 180k
PNR L
R524 5600
R523 18k
C525 0.01μ PET
C524 47 16V
Q522 MUN2213
R4.9/P0
R522 1100
C522 0.022μ PET
Q522, 532 NT/PAL SWITCH
C523 4.7 50V
R521 10k
C521 10 35V
-5V
+5V
AF SWP
FM PB
FM REC
RV532 VCO fo (R) 1.8MHz
RV531 VCO fo (R) 1.7MHz
RV541 PB RF B.P.F.
RV521 VCO fo (L) 1.3MHz
RV522 VCO fo (L) 1.4MHz
CN501 7P
JL535
JL536
JW501
1 FM REC
2 AN GND
3 FM PB
4 AF REC P
5 REC
6 AF SWP
7 AN GND
RP-199, 203 BOARD CN701 (SEE PAGE 4-7)
X715
CJ621 5P
AUDIO (MONO)
AUDIO
LINE OUT
VIDEO
VIDEO
LINE-1 IN
AUDIO
CJ621 4P
L681 100μH
R684 180 1/4W
C684 47 16V
R683 150 1/4W
R685 68
C683 470 6.3V
Q681 MSB709
R681 330
3.5
2.8
Q681 BUFFER
C681 0.01 F
C682 47 16V
R601 75
D610 RD4.3ES-B1
X815, X825, X835
CJ621 6P
JL610
VIDEO
LINE OUT DISP ON
JL617
AUDIO
X715
R611 470
JW615
JL619
R612 470
X815, X825, X835
JL609
VIDEO
LINE-1 IN
JL616
AUDIO
JL618
EA
EB
JA
JU
JY
JZ
AW
AX

no mark:REC/PB mode
R:REC mode
P:PB mode

- Signal path

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨

MA-251 (TUNER) (SLV-X825/X835) SCHEMATIC DIAGRAM • See page 4-10to 4-12 for printed wiring board.
– Ref. No.: MA-251 Board; 3,000 series –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A
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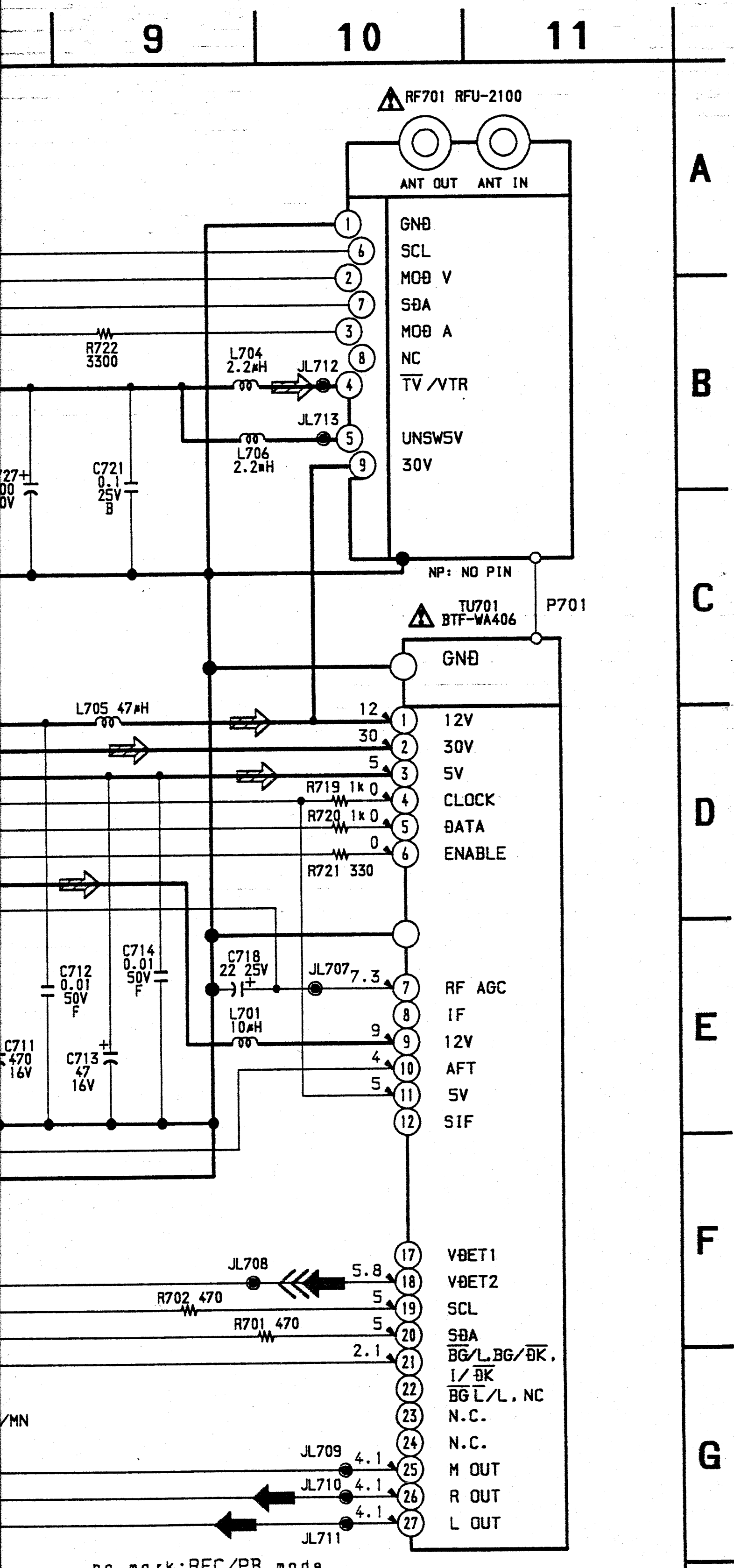
C
D
E
F
G
H
MA-251 BOARD (4/4)
R731 100
R732 100
Q704 2SB1664R
5.8
R724 1k
C728 100 10V
C729 0.001 F
D709 RD5.1ES-T1B2
D710 1SS119TD
D701 11ES2
C727 100 10V
AN GND TA
D6V TB
SW 12V TD
30V TE
SW 5V TF
PLL CLOCK TG
PLL DATA TH
TU ENABLE TI
AFT TJ
SW1 (BG/L) TK
13V TU
TA MUTE TN
AUTO PRESET TQ
TU VIDEO TS
MOD A TT
TU AU (L) TV
TU AU (R) TW
STD TX
MOD V TY
SDA TO
SCL H DET TP
②
MA-251 BOARD (2/4) (SEE PAGE 4-20)
L702 100μH
L703 10μH
JW718
L705
C702 10 50V
Q701 UN2213 AUTO PRESET
R706 10k
7.3
Q703 2SA733-K 30V REG
R703 82
38.7
32.5
D703 RD33ES-B2
JL704
38.1
R711 10k
D702 1SS226
R704 47k
C704 1000p B
C705 10 50V
C706 0.01 50V F
C707 47 16V
C708 0.01 F
C711 470 16V
C712 0.01 50V F
C713 47 16V
JR701
JR704
JR705
C701 47 16V
R738 100
R727 1k
X825MI/MN, X835ME/MN
Q710 MSB709A
2
2.6
R712 100
C703 10 50V
R710 1k
C716 10 50V
C717 10 50V
R705 2.2k
Q710 MONO BUFFER
-0.3
Q711 UN2216
Q712 UN2216
Q713 UN2216
Q714 MSB709
D708 1SS119TD
Q711-717 MUTE SWITCH

MA-252 (TUNER) (SLV-X715/X815) SCHEMATIC DIAGRAM • See page 4-13 to 4-15 for printed wiring board.

– Ref. No.: MA-252 Board; 4,000 series –

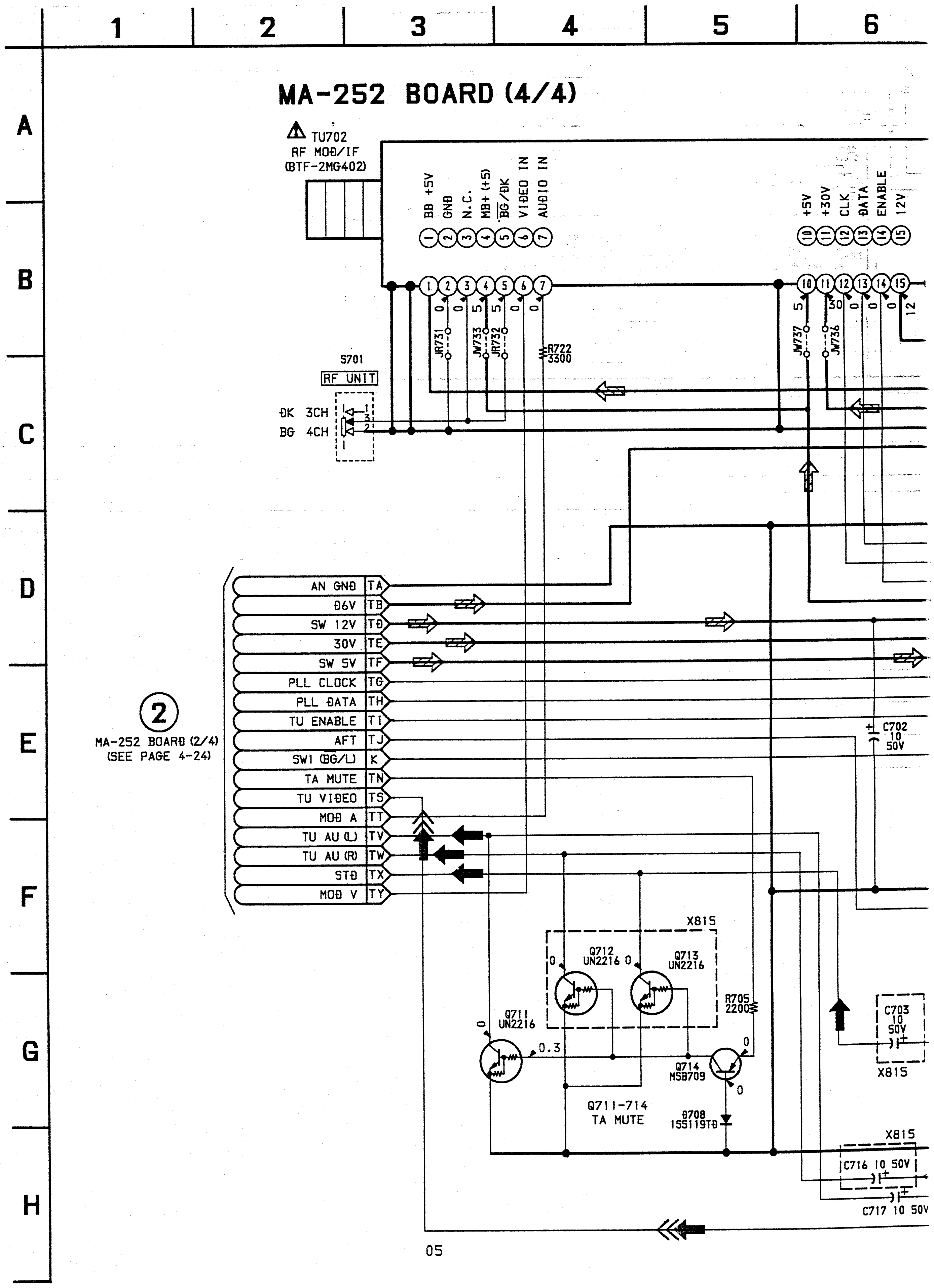


9
10
11
A
B
C
D
E
F
G
H
RF701 RFU-2100
ANT OUT
ANT IN
GND
SCL
MOD V
SDA
MOD A
NC
TV /VTR
UNSW5V
30V
R722 3300
L704 2.2μH
JL712
JL713
L706 2.2μH
C721 0.1 25V B
NP: NO PIN
TU701 BTF-WA406
P701
GND
L705 47μH
12V
30V
5V
CLOCK
DATA
ENABLE
R719 1k
R720 1k
R721 330
C712 0.01 50V F
C714 0.01 50V F
C718 22 25V
JL707
L701 10μH
C711 470 16V
C713 47 16V
RF AGC
IF
12V
AFT
5V
SIF
JL708
R702 470
R701 470
VDET1
VDET2
SCL
SDA
BG/L,BG/DK, I/DK
BG L/L, NC
N.C.
N.C.
M OUT
R OUT
L OUT
JL709
JL710
JL711

no mark:REC/PB mode

- Signal path

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➠	➡➠	➡
PB	⇨	⇨	⇨⇨	⇨



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A
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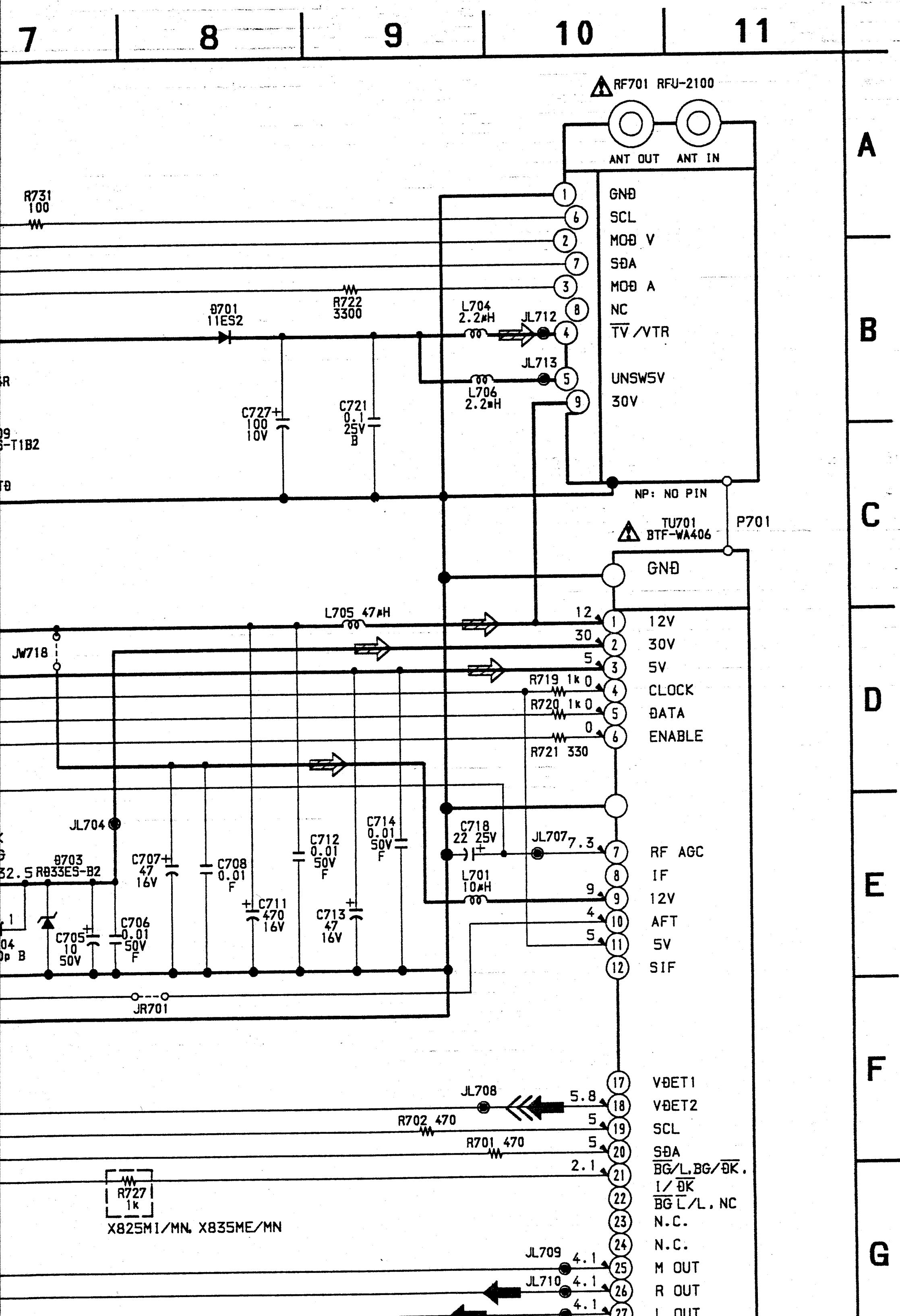
C
D
E
F
G
H
MA-252 BOARD (4/4)
TU702
RF MOD/IF
(BTF-2MG402)
BB +5V
GND
N.C.
MB+ (+5)
BG/DK
VIDEO IN
AUDIO IN
+5V
+30V
CLK
DATA
ENABLE
12V
JR731
JW733
JR732
R722 3300
JW737
JW736
S701
RF UNIT
DK 3CH
BG 4CH
AN GND TA
D6V TB
SW 12V TD
30V TE
SW 5V TF
PLL CLOCK TG
PLL DATA TH
TU ENABLE TI
AFT TJ
SW1 (BG/L) K
TA MUTE TN
TU VIDEO TS
MOD A TT
TU AU (L) TV
TU AU (R) TW
STD TX
MOD V TY
②
MA-252 BOARD (2/4)
(SEE PAGE 4-24)
C702 10 50V
X815
Q712 UN2216
Q713 UN2216
R705 2200
Q711 UN2216
Q714 MSB709
C703 10 50V
X815
Q711-714 TA MUTE
D708 1SS119TD
X815
C716 10 50V
C717 10 50V
05

MA-252 (TUNER) (SLV-X715/X815) SCHEMATIC DIAGRAM • See page 4-13 to 4-15 f

– Ref. No.: MA-252 Board; 4,000 series –



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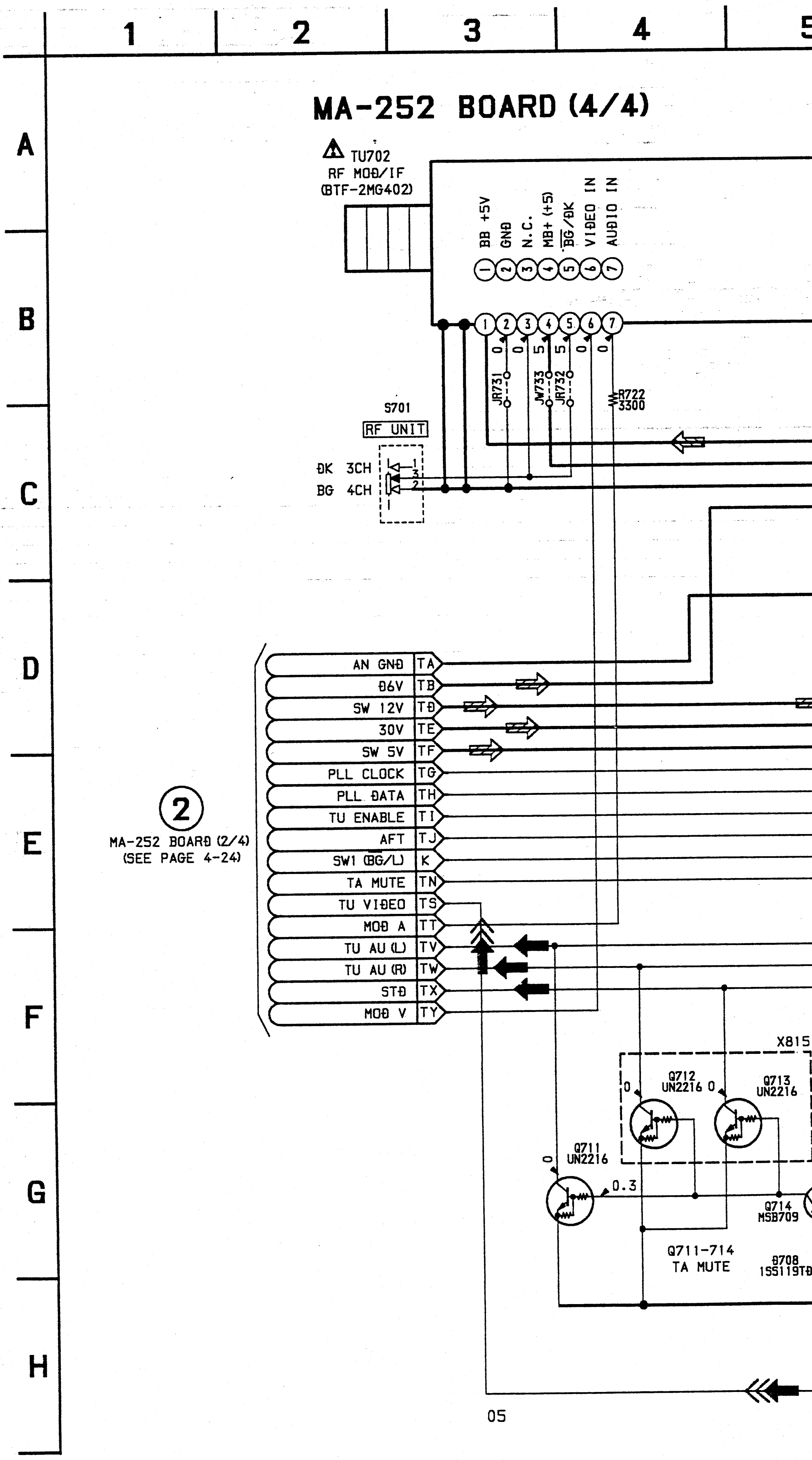
A
B
C
D
E
F
G
H
RF701 RFU-2100
ANT OUT
ANT IN
R731 100
GND
SCL
MOD V
SDA
MOD A
NC
TV/VTR
UNSWSV
30V
D701 11ES2
R722 3300
L704 2.2μH
JL712
JL713
L706 2.2μH
C727 100 10V
C721 0.1 25V B
NP: NO PIN
P701
TU701 BTF-WA406
GND
L705 47μH
JW718
12V
30V
5V
CLOCK
DATA
ENABLE
R719 1k
R720 1k
R721 330
JL704
D703 RD33ES-B2
C707 47 16V
C708 0.01 F
C712 0.01 50V F
C714 0.01 50V F
C718 22 25V
JL707
7.3
RF AGC
IF
12V
AFT
5V
SIF
L701 10μH
C711 470 16V
C713 47 16V
C705 10 50V
C706 0.01 50V F
JR701
JL708
5.8
VDET1
VDET2
SCL
SDA
R702 470
R701 470
BG/L,BG/DK, I/DK
BG L/L, NC
N.C.
N.C.
M OUT
R OUT
L OUT
R727 1k
X825M1/MN, X835ME/MN
JL709
JL710
JL711
4.1

no mark:REC/PB mode

- Signal path

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨



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A
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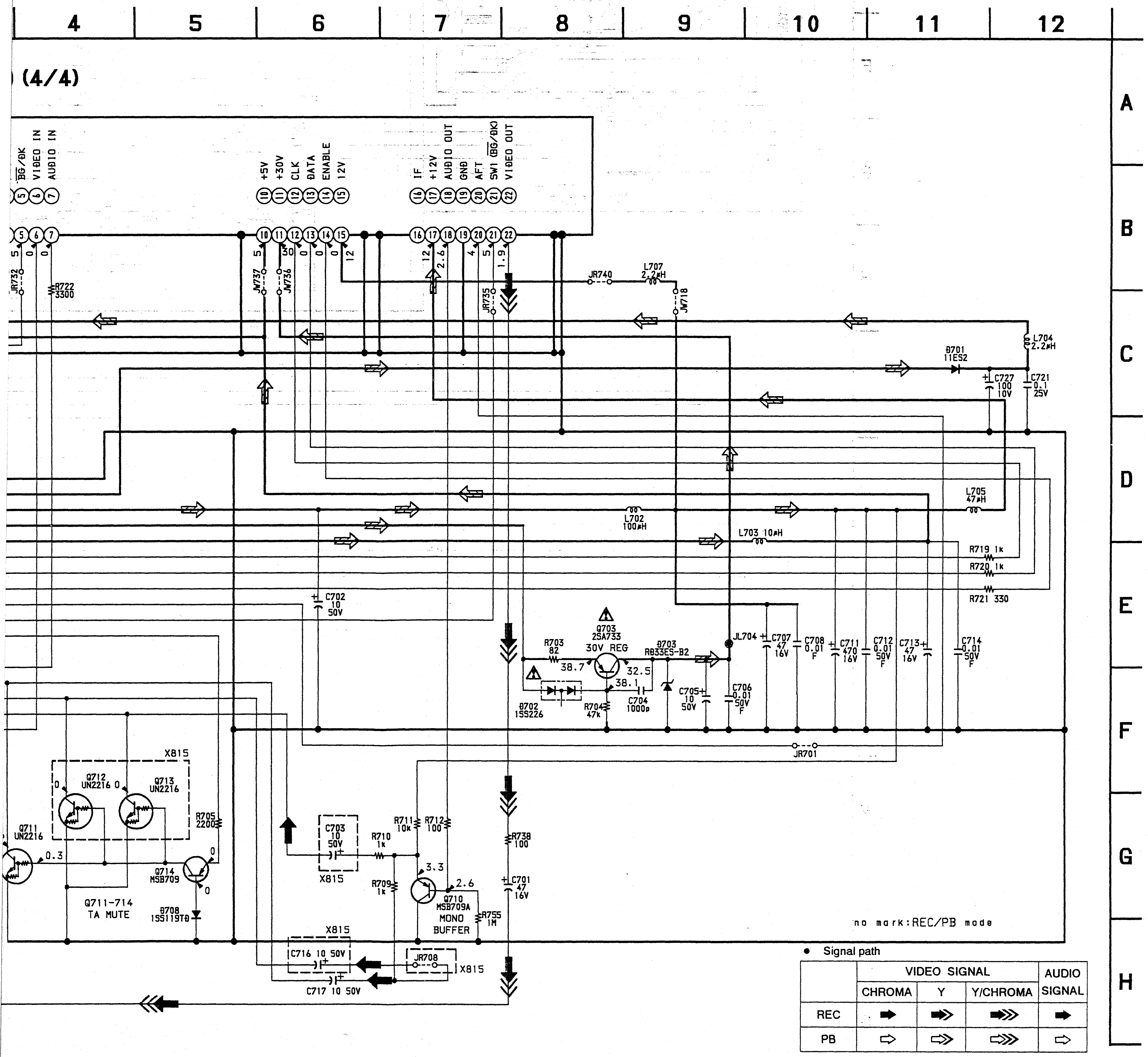
F
G
H
MA-252 BOARD (4/4)
TU702
RF MOD/IF
(BTF-2MG402)
BB +5V
GND
N.C.
MB+ (+5)
BG/DK
VIDEO IN
AUDIO IN
JR731
JW733
JR732
R722 3300
S701
RF UNIT
DK 3CH
BG 4CH
AN GND TA
D6V TB
SW 12V TD
30V TE
SW 5V TF
PLL CLOCK TG
PLL DATA TH
TU ENABLE TI
AFT TJ
SW1 (BG/L) K
TA MUTE TN
TU VIDEO TS
MOD A TT
TU AU (L) TV
TU AU (R) TW
STD TX
MOD V TY
②
MA-252 BOARD (2/4)
(SEE PAGE 4-24)
X815
Q712 UN2216
Q713 UN2216
Q711 UN2216
Q714 MSB709
Q711-714 TA MUTE
D708 1SS119TD
0.3
05

RAM • See page 4-13 to 4-15 for printed wiring board.

) (4/4)



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12
A
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C
D
E
F
G
H
BG/BK
VIDEO IN
AUDIO IN
+5V
+30V
CLK
DATA
ENABLE
12V
IF
+12V
AUDIO OUT
GND
AFT
SW1 (BG/BK)
VIDEO OUT
JR732
R722 3300
JW737
JW736
JR740
L707 2.2μH
JW718
JR735
L704 2.2μH
D701 11ES2
C727 100 10V
C721 0.1 25V
L705 47μH
L702 100μH
L703 10μH
R719 1k
R720 1k
R721 330
C702 10 50V
Q703 2SA733 30V REG
R703 82
D703 RD33ES-B2
38.7
32.5
38.1
D702 1SS226
R704 47k
C704 1000p
C705 10 50V
C706 0.01 50V F
JL704
C707 47 16V
C708 0.01 F
C711 470 16V
C712 0.01 50V F
C713 47 16V
C714 0.01 50V F
JR701
X815
Q712 UN2216
Q713 UN2216
Q711 UN2216
R705 2200
Q714 MSB709
D708 1SS119TD
Q711-714 TA MUTE
0.3
C703 10 50V
R710 1k
R711 10k
R712 100
R709 1k
3.3
2.6
Q710 MSB709A MONO BUFFER
R755 1M
R738 100
C701 47 16V
C716 10 50V
C717 10 50V
JR708
no mark:REC/PB mode

- Signal path

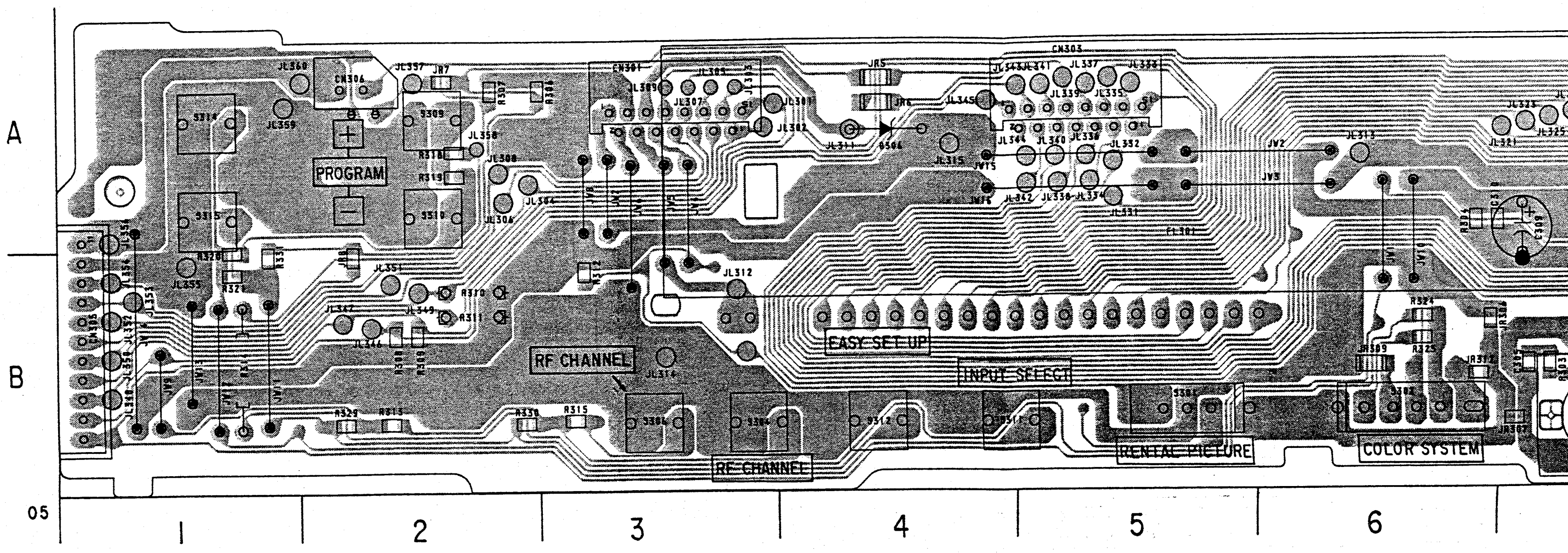
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡›	➡››	➡
PB	⇨	⇨›	⇨››	⇨

There are cases that the part isn't mounted in this model is printed on this diagram.

DM-49 (MODE CONTROL), HI-25 (FL DRIVER), MF-285 (POWER SWITCH), LE-13 (LED) (SLV-X825/X835) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

– Ref. No.: DM-49 Board, HI-25 Board, MF-285 Board and LE-13 Board; 1,000 series –

HI-25 BOARD



A
B
PROGRAM
RF CHANNEL
EASY SET UP
INPUT SELECT
RF CHANNEL
RENTAL PICTURE
COLOR SYSTEM
CN306
CN301
CN303
FL301
05
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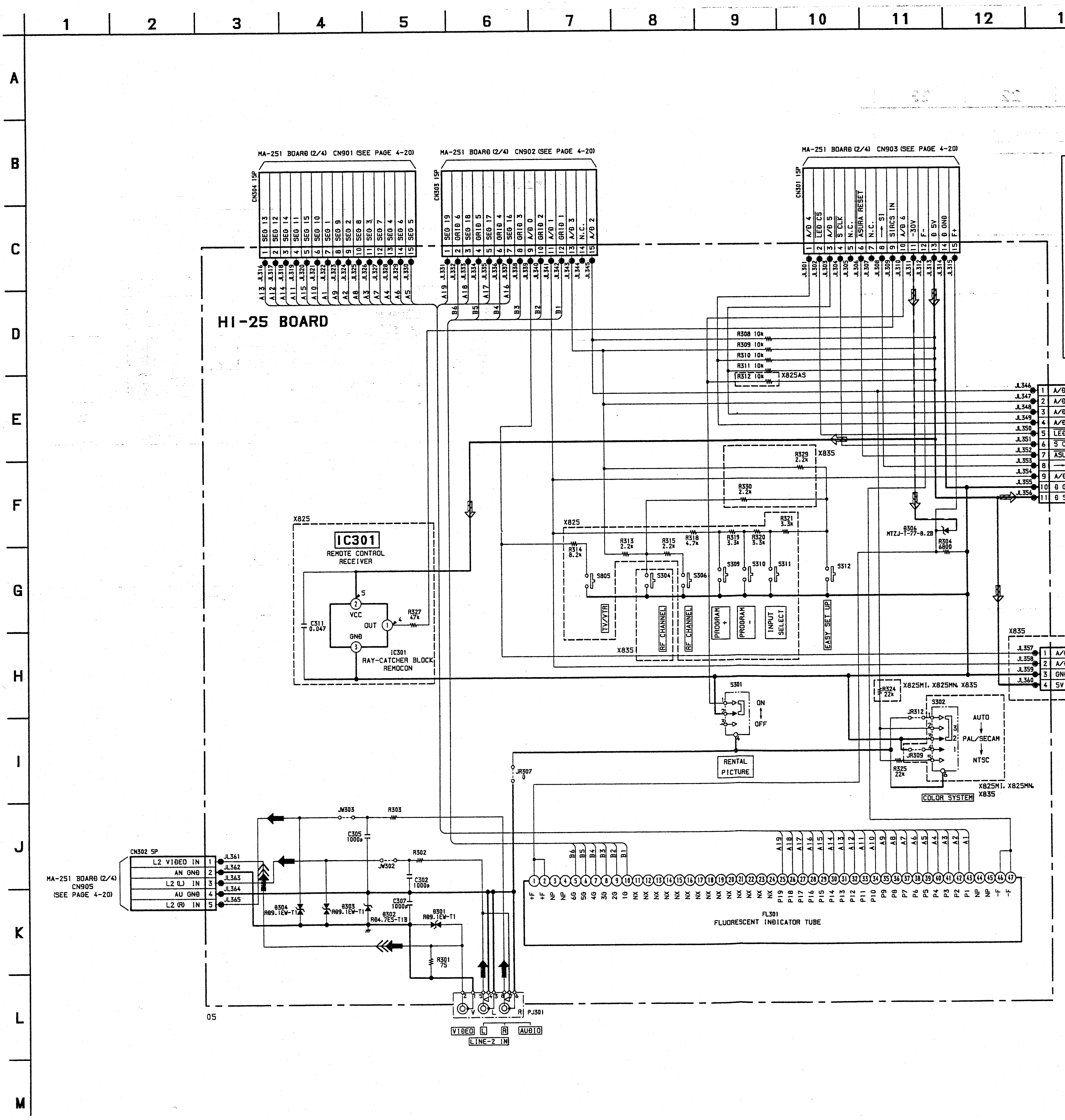
6



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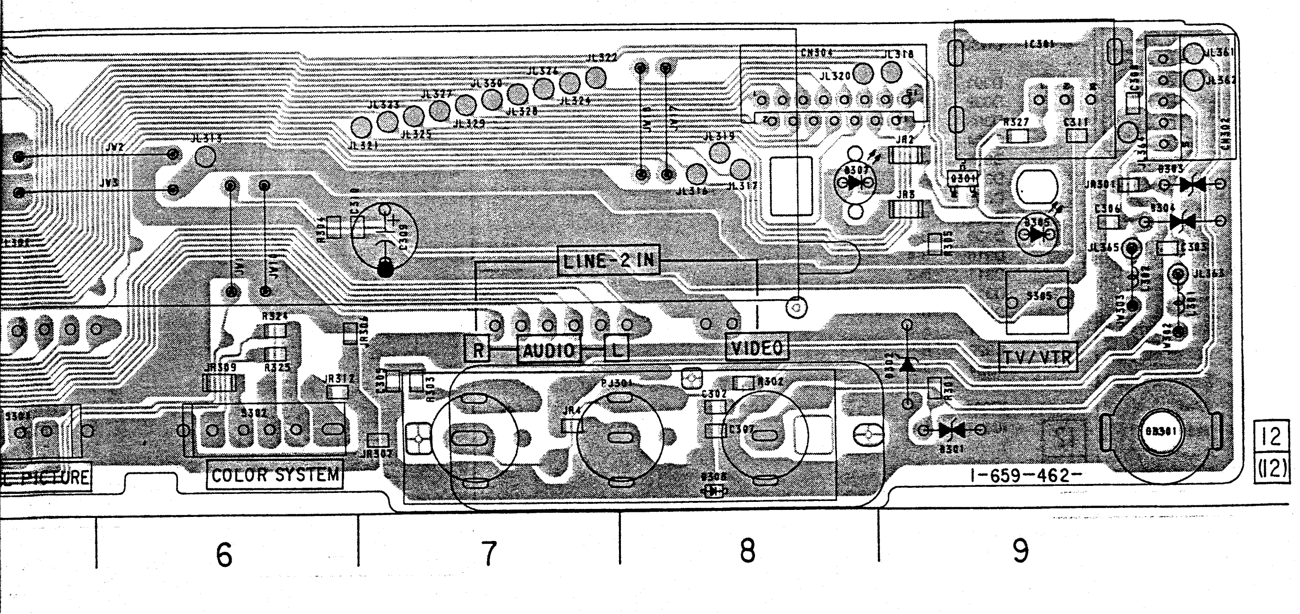
I
J
K
L
M
HI-25 BOARD
MA-251 BOARD (2/4) CN901 (SEE PAGE 4-20)
MA-251 BOARD (2/4) CN902 (SEE PAGE 4-20)
MA-251 BOARD (2/4) CN903 (SEE PAGE 4-20)
CN304 15P
CN305 15P
CN301 15P
IC301
REMOTE CONTROL RECEIVER
IC301 RAY-CATCHER BLOCK REMOCON
VCC
OUT
GND
X825
X835
X825AS
X825MI, X825MN, X835
S301 ON OFF
RENTAL PICTURE
S302 AUTO PAL/SECAM NTSC
COLOR SYSTEM
TV/VTR
RF CHANNEL
PROGRAM +
PROGRAM -
INPUT SELECT
EASY SET UP
CN302 5P
L2 VIDEO IN
AN GND
L2 (L) IN
AU GND
L2 (R) IN
MA-251 BOARD (2/4) CN905 (SEE PAGE 4-20)
FL301 FLUORESCENT INDICATOR TUBE
PJ301
VIDEO
L
R
AUDIO
LINE-2 IN
05

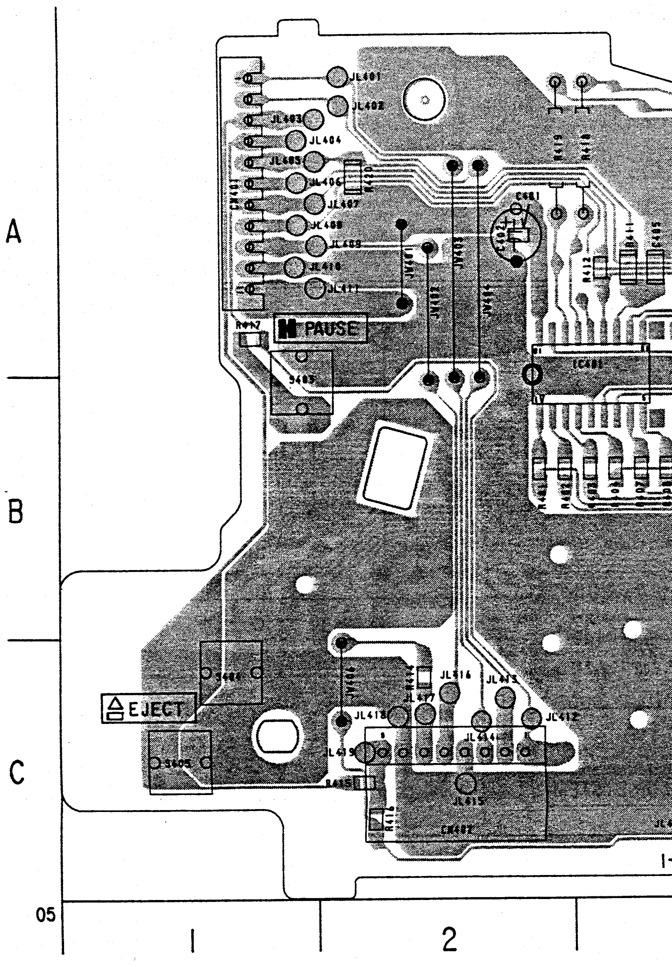
RAM

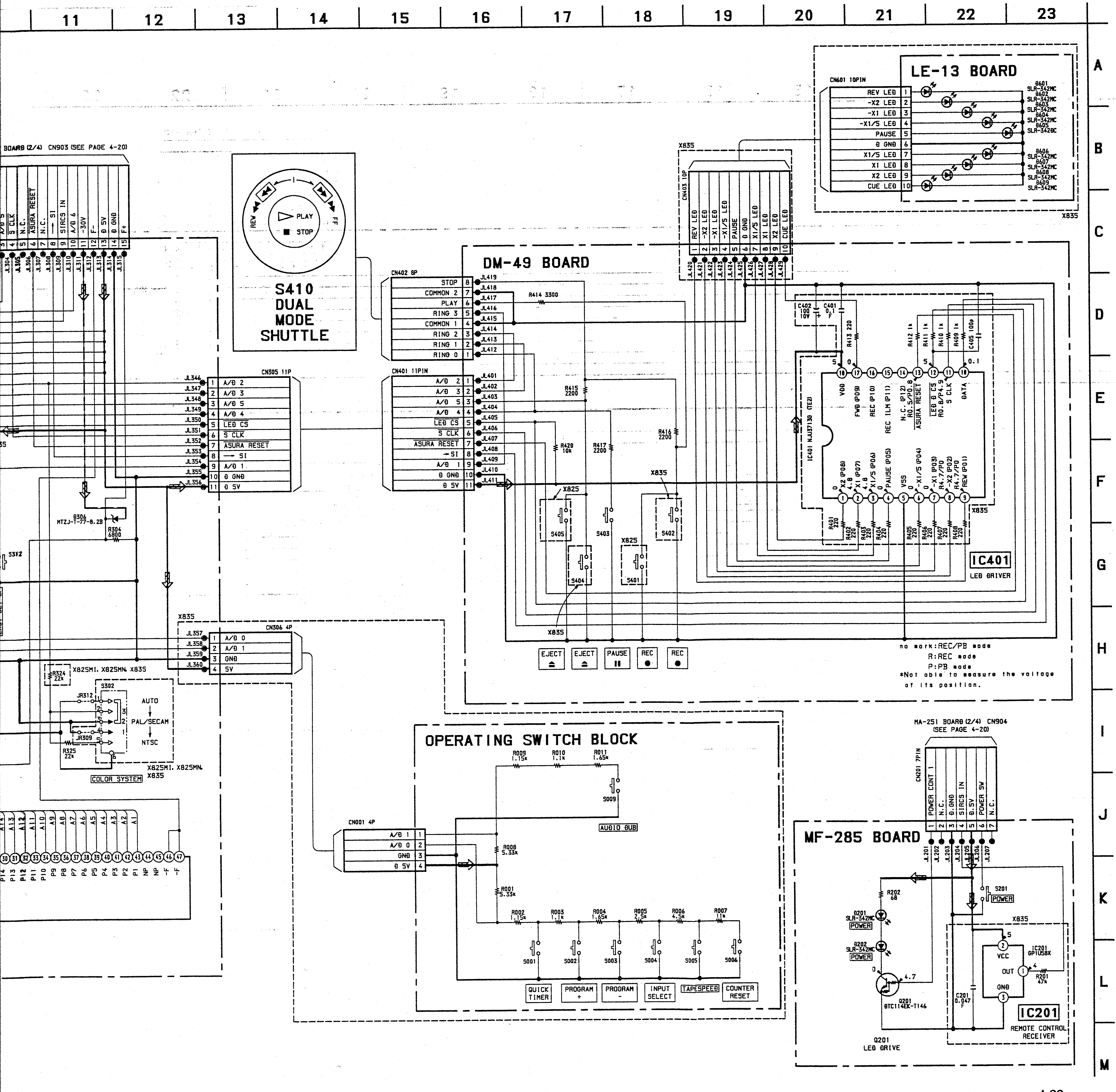

LINE-2 IN
R
AUDIO
L
VIDEO
TV/VTR
COLOR SYSTEM
PICTURE
1-659-462-
12
(12)
6
7
8
9

HI-25 BOARD

CN301	A-3
CN302	A-9
CN303	A-5
CN304	A-8
CN305	B-1
CN306	A-2
D301	B-9
D302	B-9
D303	A-9
D304	A-9
D306	A-4

DM-49 BOARD


PAUSE
EJECT
A
B
C
05
1
2


11
12
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16
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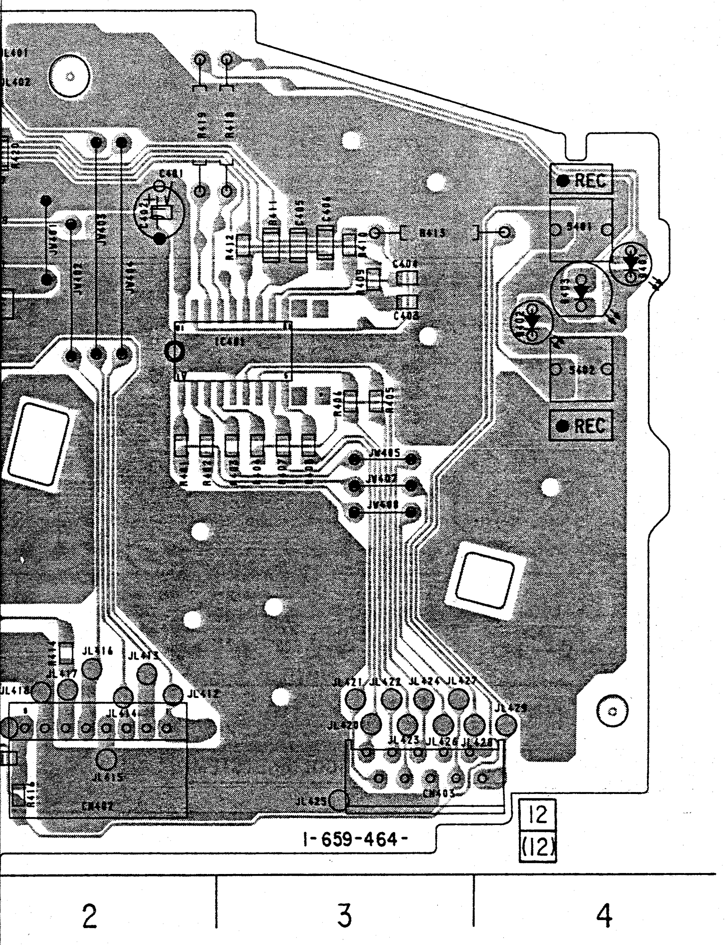
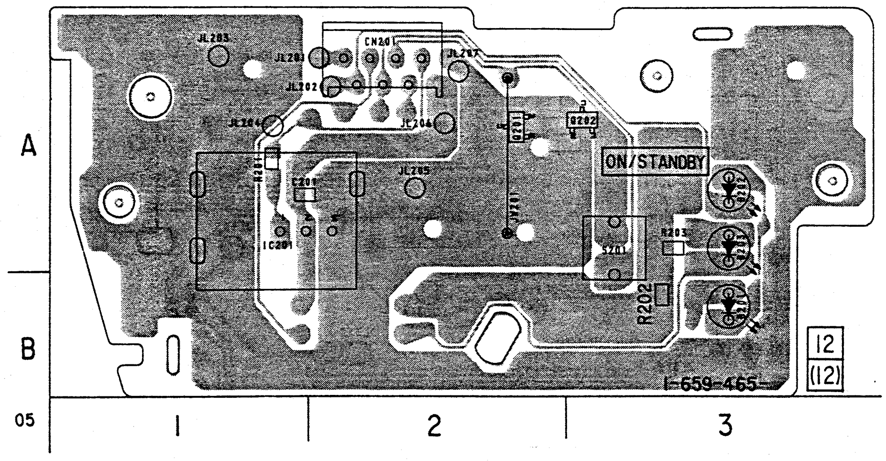
19
20
21
22
23
A
B
C
D
E
F
G
H
I
J
K
L
M
LE-13 BOARD
CN601 10PIN
REV LED
-X2 LED
-X1 LED
-X1/5 LED
PAUSE
B GND
X1/5 LED
X1 LED
X2 LED
CUE LED
X835
S410
DUAL
MODE
SHUTTLE
PLAY
STOP
REV
FF
DM-49 BOARD
CN402 8P
CN401 11PIN
CN305 11P
CN306 4P
IC401
LED DRIVER
EJECT
PAUSE
REC
no mark:REC/PB mode
R:REC mode
P:PB mode
*Not able to measure the voltage of its position.
OPERATING SWITCH BLOCK
AUDIO DUB
QUICK TIMER
PROGRAM +
PROGRAM -
INPUT SELECT
TAPESPEED
COUNTER RESET
MA-251 BOARD (2/4) CN904 (SEE PAGE 4-20)
MF-285 BOARD
POWER
IC201
REMOTE CONTROL RECEIVER
Q201
LED DRIVE
COLOR SYSTEM
AUTO
PAL/SECAM
NTSC
BOARD (2/4) CN903 (SEE PAGE 4-20)


REC
REC
IC401
CN402
CN403
1-659-464-
12
(12)
2
3
4

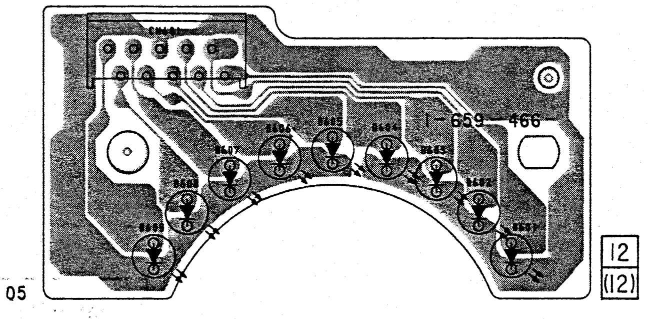
DM-49 BOARD

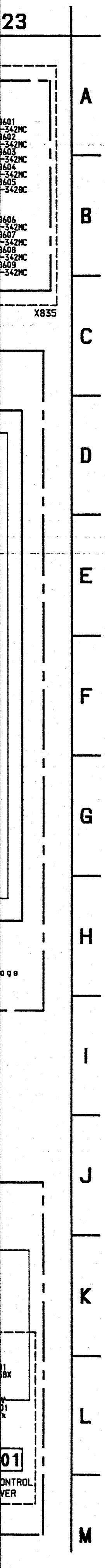
CN401	A-1
CN402	C-2
CN403	C-3
IC401	B-3

MF-285 BOARD


A
B
05
ON/STANDBY
IC201
CN201
R202
1-659-465
12
(12)
1
2
3

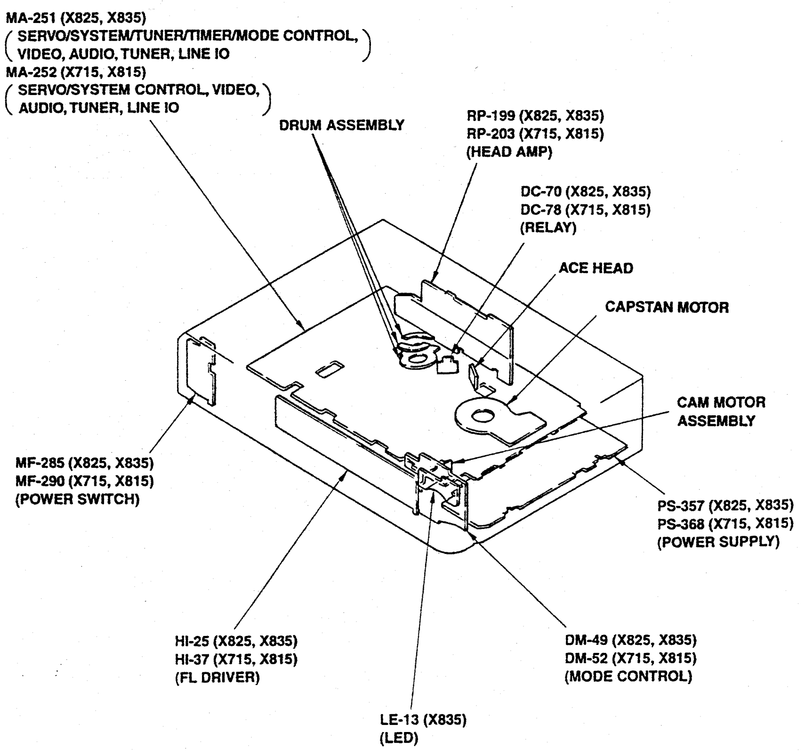
LE-13 BOARD


CN601
1-659-466
05
12
(12)


23
A
B
C
D
E
F
G
H
I
J
K
L
M
X835

- Signal path

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡>	➡>>	➡
PB	⇨	⇨>	⇨>>	⇨

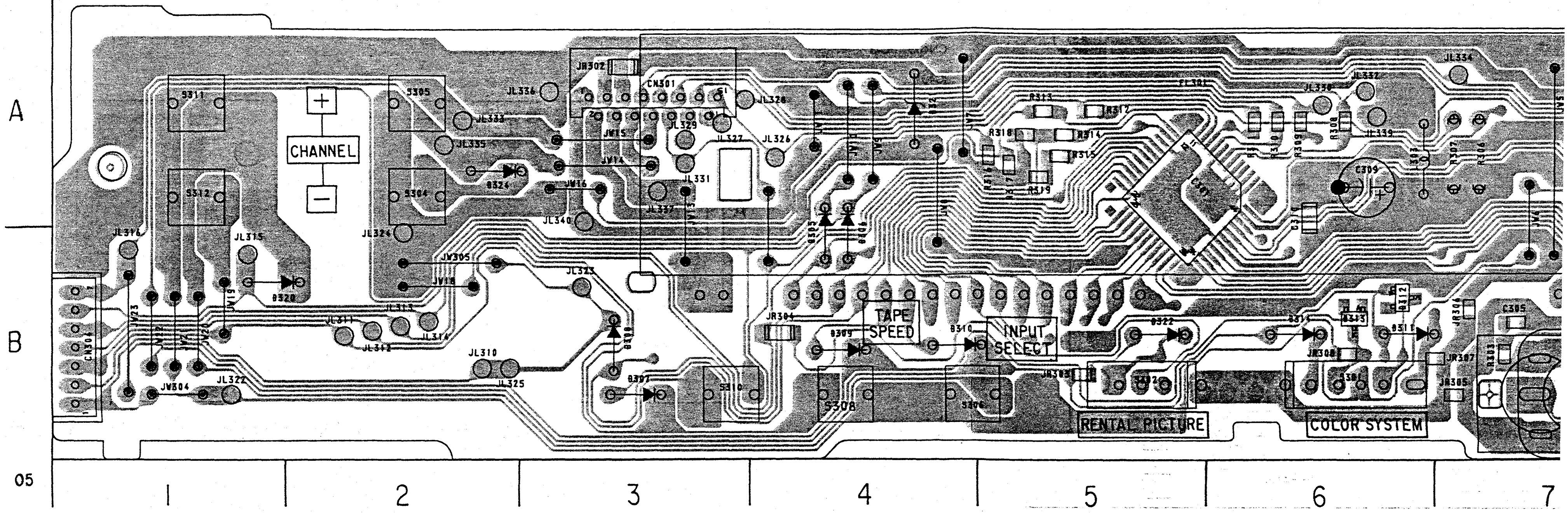

MA-251 (X825, X835)
(SERVO/SYSTEM/TUNER/TIMER/MODE CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
MA-252 (X715, X815)
(SERVO/SYSTEM CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
DRUM ASSEMBLY
RP-199 (X825, X835)
RP-203 (X715, X815)
(HEAD AMP)
DC-70 (X825, X835)
DC-78 (X715, X815)
(RELAY)
ACE HEAD
CAPSTAN MOTOR
CAM MOTOR ASSEMBLY
MF-285 (X825, X835)
MF-290 (X715, X815)
(POWER SWITCH)
PS-357 (X825, X835)
PS-368 (X715, X815)
(POWER SUPPLY)
HI-25 (X825, X835)
HI-37 (X715, X815)
(FL DRIVER)
DM-49 (X825, X835)
DM-52 (X715, X815)
(MODE CONTROL)
LE-13 (X835)
(LED)

There are cases that the part isn't mounted in this model is printed on this diagram.

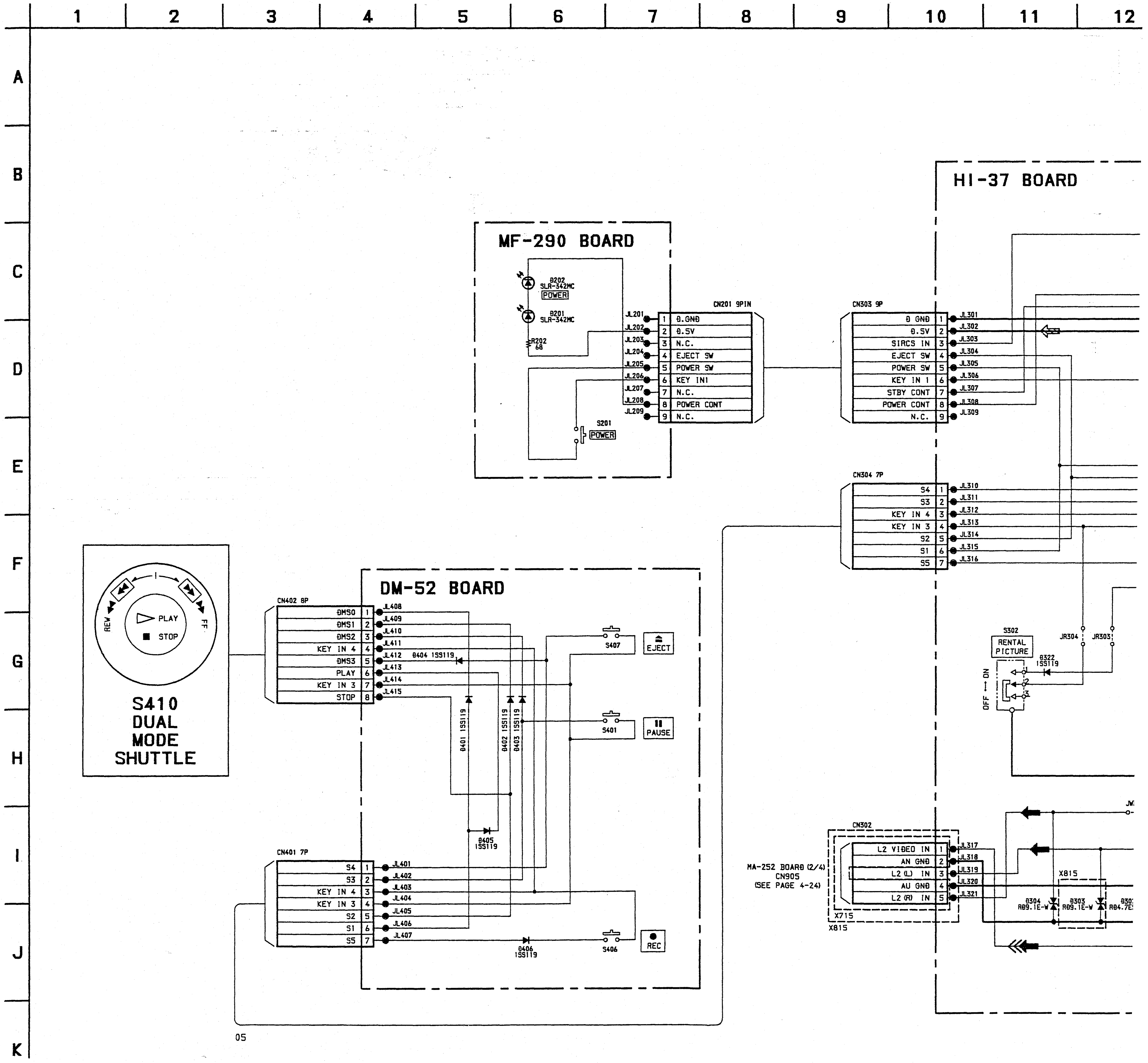
DM-52 (MODE CONTROL), HI-37 (FL DRIVER), MF-290 (POWER SWITCH) (SLV-X715/X815) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

– Ref. No.: DM-52 Board, HI-37 Board and MF-290 Board; 2,000 series –

HI-37 BOARD



A
B
05
1
2
3
4
5
6
7
CHANNEL
+
−
S311
S312
S305
S304
S310
S308
S306
CN301
TAPE SPEED
INPUT SELECT
RENTAL PICTURE
COLOR SYSTEM
C309



1
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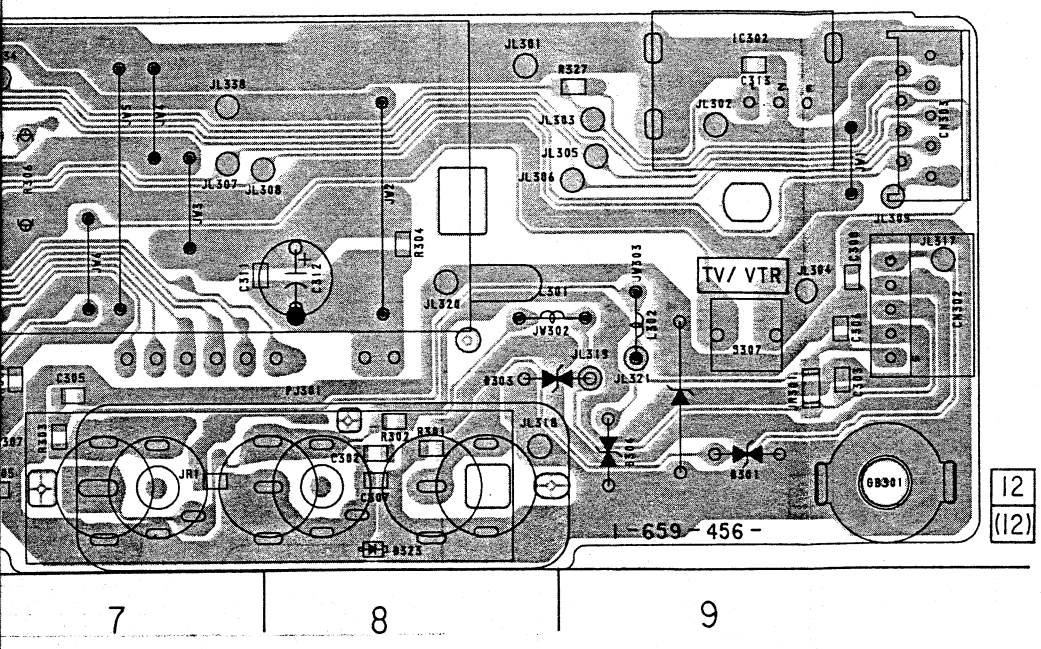
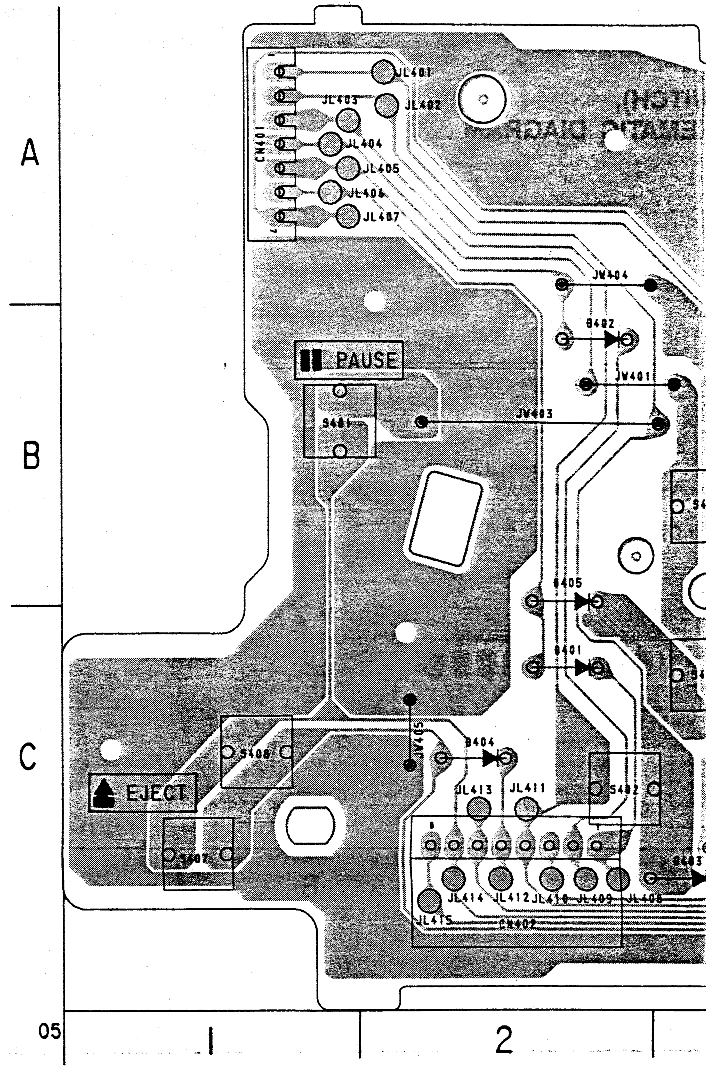
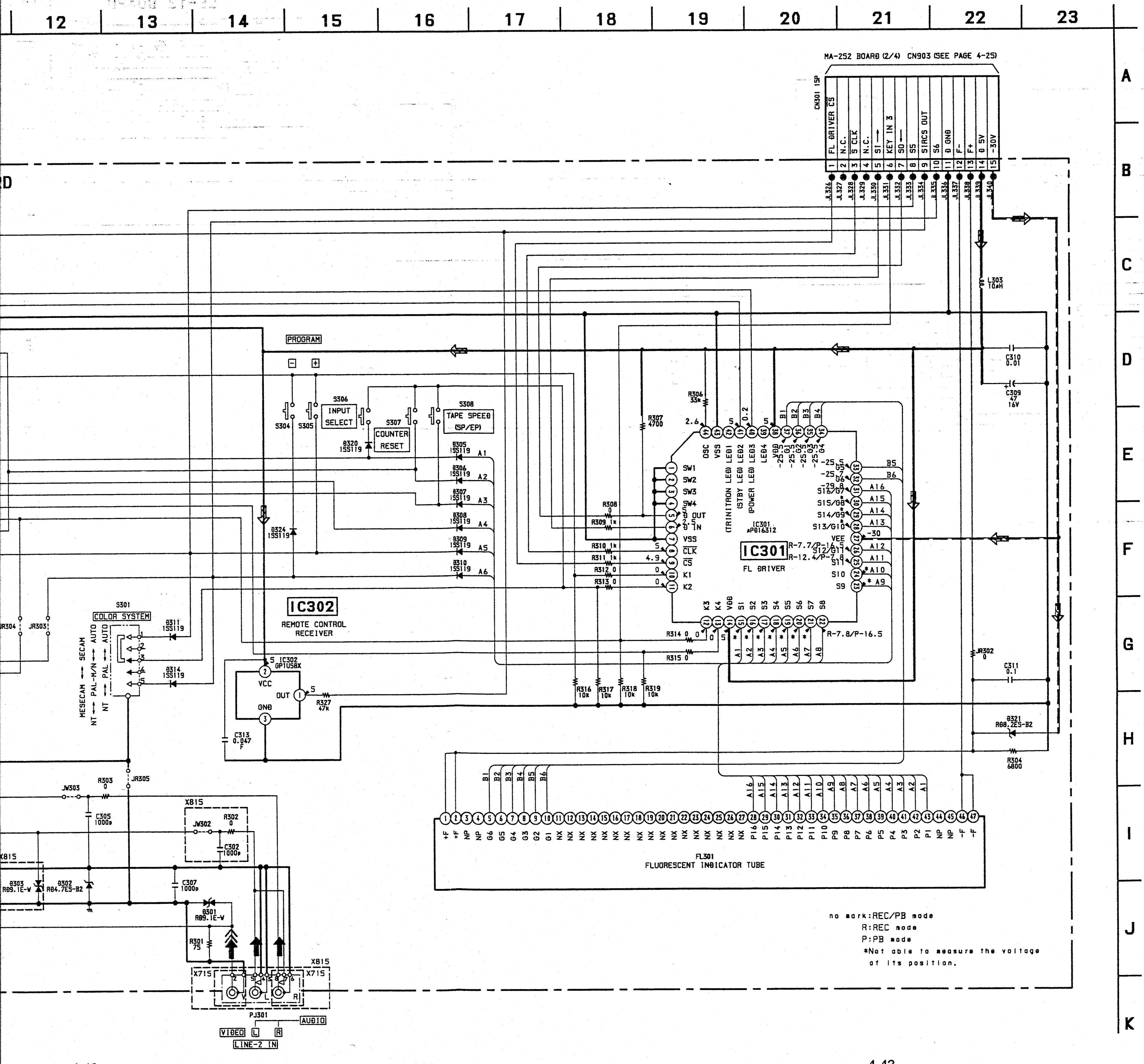
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
K
MF-290 BOARD
D202 SLR-342MC POWER
D201 SLR-342MC
R202 68
S201 POWER
CN201 9PIN
0.GND
0.5V
N.C.
EJECT SW
POWER SW
KEY IN1
N.C.
POWER CONT
N.C.
HI-37 BOARD
CN303 9P
0 GND
0.5V
SIRCS IN
EJECT SW
POWER SW
KEY IN 1
STBY CONT
POWER CONT
N.C.
CN304 7P
S4
S3
KEY IN 4
KEY IN 3
S2
S1
S5
S302 RENTAL PICTURE
OFF — ON
D322 1SS119
JR304
JR303
CN302
L2 VIDEO IN
AN GND
L2 (L) IN
AU GND
L2 (R) IN
MA-252 BOARD (2/4) CN905 (SEE PAGE 4-24)
X715
X815
D304 RD9.1E-W
D303 RD9.1E-W
S410 DUAL MODE SHUTTLE
REW
FF
PLAY
STOP
DM-52 BOARD
CN402 8P
DMS0
DMS1
DMS2
KEY IN 4
DMS3
PLAY
KEY IN 3
STOP
D404 1SS119
S407 EJECT
S401 PAUSE
D401 1SS119
D402 1SS119
D403 1SS119
D405 1SS119
CN401 7P
S4
S3
KEY IN 4
KEY IN 3
S2
S1
S5
D406 1SS119
S406 REC
05


TV/VTR
1-659-456-
12
(12)
7
8
9

HI-37 BOARD	
CN301	A-3
CN302	B-10
CN303	A-10
CN304	B-1
D301	B-9
D302	B-9
D303	B-8
D304	B-9
D305	A-4
D306	A-4
D307	B-3
D308	B-3
D309	B-4
D310	B-4
D311	B-6
D314	B-6
D320	B-1
D321	A-4
D322	B-5
D324	A-2
IC301	A-5
IC302	A-9

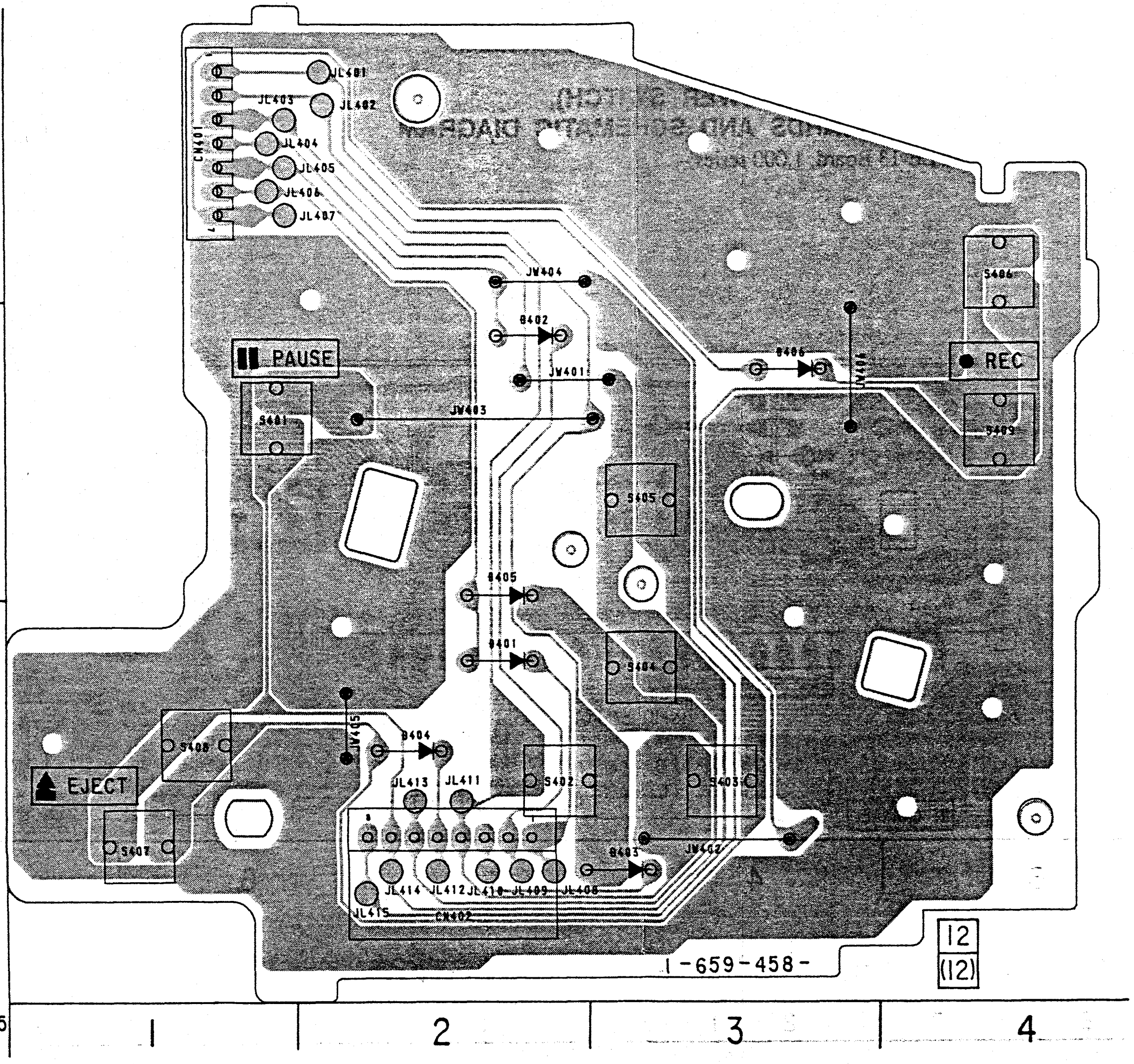
DM-52 BOARD


A
B
C
PAUSE
EJECT
CN401
CN402
S401
S402
S407
S408
05
1
2


12
13
14
15
16
17
18
19
20
21
22
23
A
B
C
D
E
F
G
H
I
J
K
MA-252 BOARD (2/4) CN903 (SEE PAGE 4-25)
CN301 15P
FL DRIVER CS
N.C.
S CLK
N.C.
SI
KEY IN 3
SO
S5
SIRCS OUT
S6
D GND
F-
F+
D 5V
-30V
PROGRAM
S304
S305
S306 INPUT SELECT
S307 COUNTER RESET
S308 TAPE SPEED (SP/EP)
S301 COLOR SYSTEM
NT ↔ PAL ↔ MESECAM
NT ↔ PAL-M/N ↔ SECAM
AUTO
IC302 REMOTE CONTROL RECEIVER
IC302 GP1U58X
VCC
OUT
GND
IC301 FL DRIVER
IC301 μPD16312
L303 10μH
C310 0.01
C309 47 16V
FL301 FLUORESCENT INDICATOR TUBE
X715
X815
PJ301
VIDEO
L
R
AUDIO
LINE-2 IN

no mark:REC/PB mode
R:REC mode
P:PB mode
*Not able to measure the voltage
of its position.

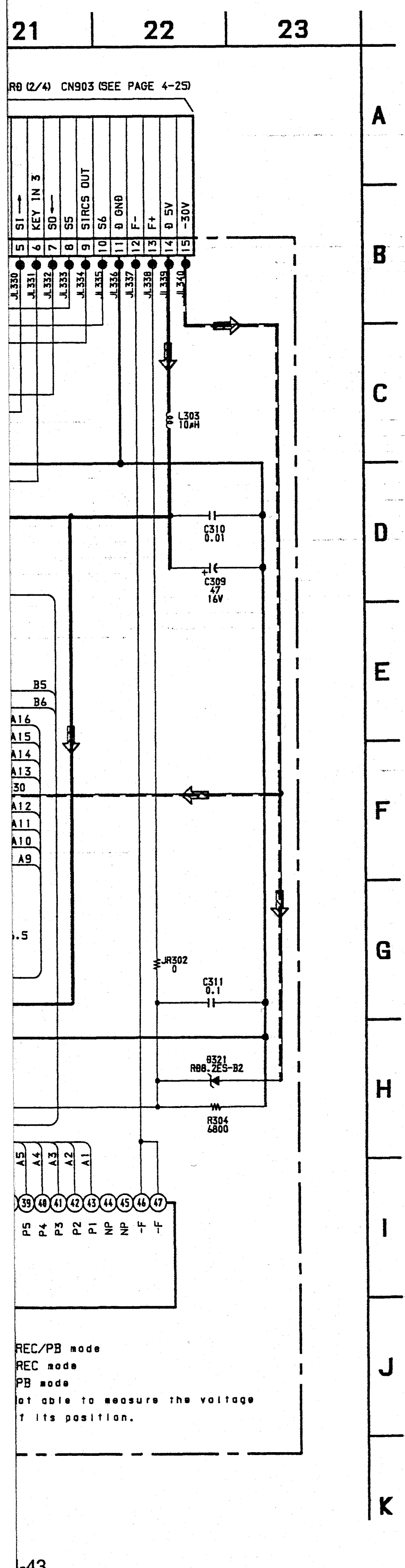
DM-52 BOARD



A
B
C
05
1
2
3
4
CN401
JL401
JL402
JL403
JL404
JL405
JL406
JL407
JW404
D402
JW401
JW403
PAUSE
S401
S405
S406
D406
JW416
REC
S409
D405
D401
S404
JW415
D404
S408
EJECT
S407
JL413
JL411
S402
S403
D403
JW402
JL414
JL412
JL410
JL409
JL408
JL415
CN402
1-659-458-
12
(12)

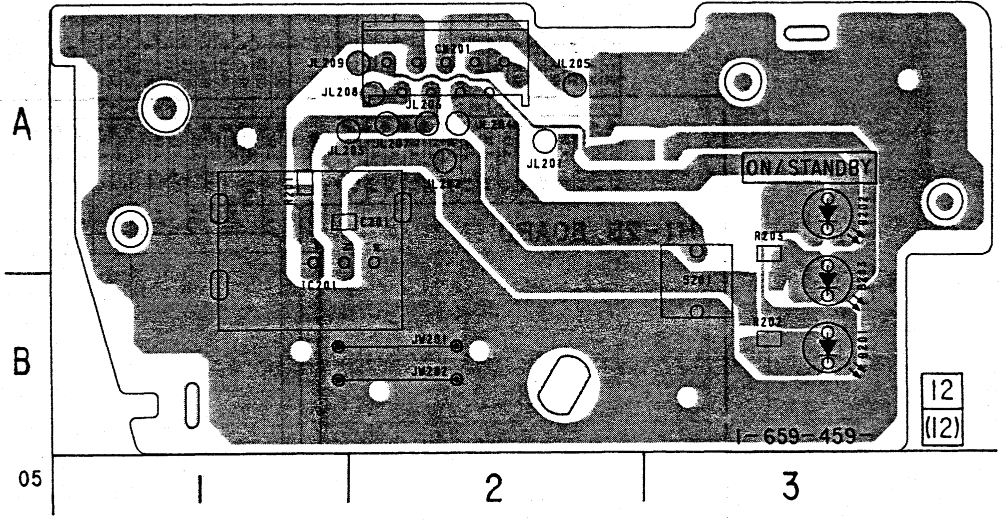
DM-52 BOARD

CN401	A-1
CN402	C-2
D401	C-2
D402	B-2
D403	C-3
D404	C-2
D405	B-2
D406	B-3



21
22
23
A
B
C
D
E
F
G
H
I
J
K
R0 (2/4) CN903 (SEE PAGE 4-25)
S1
KEY IN 3
SO
S5
S1RCS OUT
S6
D GND
F-
F+
D 5V
-30V
5 6 7 8 9 10 11 12 13 14 15
L303
10μH
C310
0.01
C309
47
16V
B5
B6
A16
A15
A14
A13
A12
A11
A10
A9
JR302
0
C311
0.1
D321
RD8.2ES-B2
R304
6800
A5 A4 A3 A2 A1
39 40 41 42 43 44 45 46 47
P5 P4 P3 P2 P1 NP NP -F -F
REC/PB mode
REC mode
PB mode
ot able to measure the voltage
f its position.

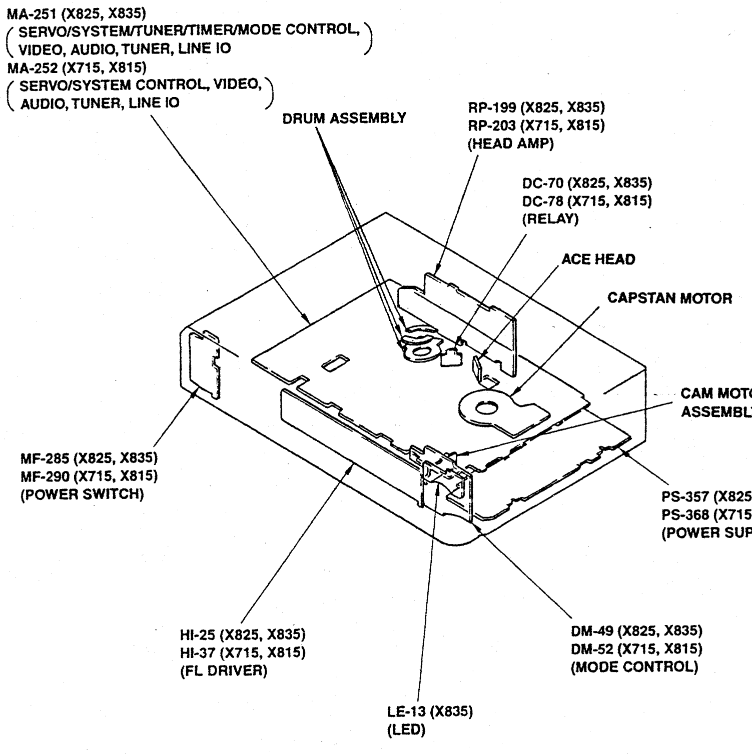
MF-290 BOARD



A
B
05
1
2
3
JL209
JL208
JL205
JL206
ON/STANDBY
IC201
C201
R203
R202
S201
JW201
JW202
1-659-459-
12
(12)

- Signal path

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡➡	➡➡➡	➡
PB	⇨	⇨⇨	⇨⇨⇨	⇨

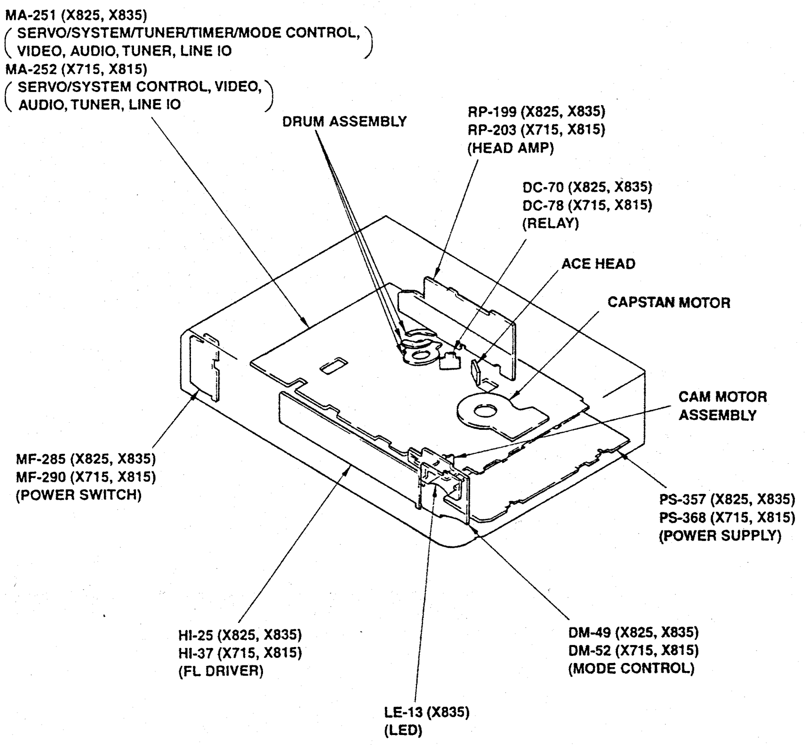


MA-251 (X825, X835)
(SERVO/SYSTEM/TUNER/TIMER/MODE CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
MA-252 (X715, X815)
(SERVO/SYSTEM CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
DRUM ASSEMBLY
RP-199 (X825, X835)
RP-203 (X715, X815)
(HEAD AMP)
DC-70 (X825, X835)
DC-78 (X715, X815)
(RELAY)
ACE HEAD
CAPSTAN MOTOR
CAM MOTOR ASSEMBLY
MF-285 (X825, X835)
MF-290 (X715, X815)
(POWER SWITCH)
PS-357 (X825, X835)
PS-368 (X715, X815)
(POWER SUPPLY)
HI-25 (X825, X835)
HI-37 (X715, X815)
(FL DRIVER)
DM-49 (X825, X835)
DM-52 (X715, X815)
(MODE CONTROL)
LE-13 (X835)
(LED)

There are cases that the part isn't mounted in this model is printed on this diagram.

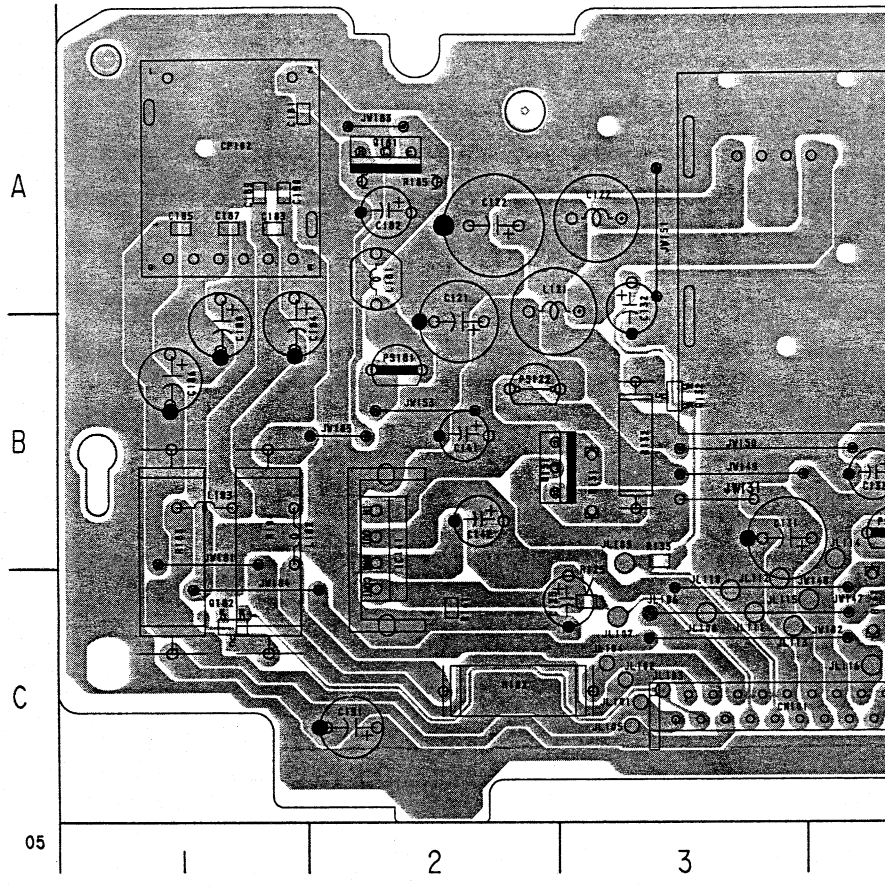
PS-357/368 (POWER SUPPLY) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

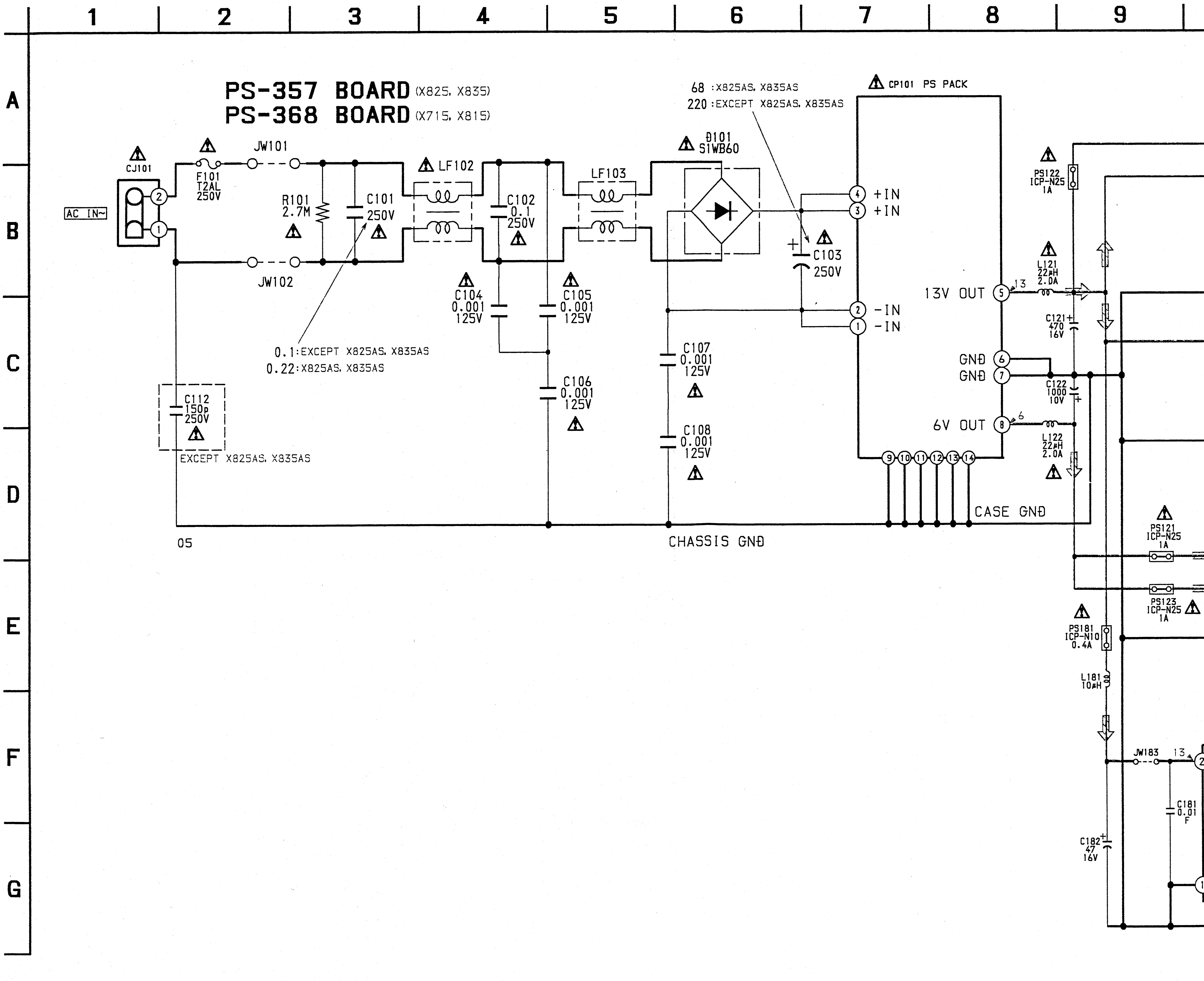
– Ref. No.: PS-357/368 Boards; 1,000 series –



MA-251 (X825, X835)
(SERVO/SYSTEM/TUNER/TIMER/MODE CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
MA-252 (X715, X815)
(SERVO/SYSTEM CONTROL, VIDEO, AUDIO, TUNER, LINE IO)
DRUM ASSEMBLY
RP-199 (X825, X835)
RP-203 (X715, X815)
(HEAD AMP)
DC-70 (X825, X835)
DC-78 (X715, X815)
(RELAY)
ACE HEAD
CAPSTAN MOTOR
CAM MOTOR ASSEMBLY
MF-285 (X825, X835)
MF-290 (X715, X815)
(POWER SWITCH)
PS-357 (X825, X835)
PS-368 (X715, X815)
(POWER SUPPLY)
HI-25 (X825, X835)
HI-37 (X715, X815)
(FL DRIVER)
DM-49 (X825, X835)
DM-52 (X715, X815)
(MODE CONTROL)
LE-13 (X835)
(LED)

PS-357/368 BOARD





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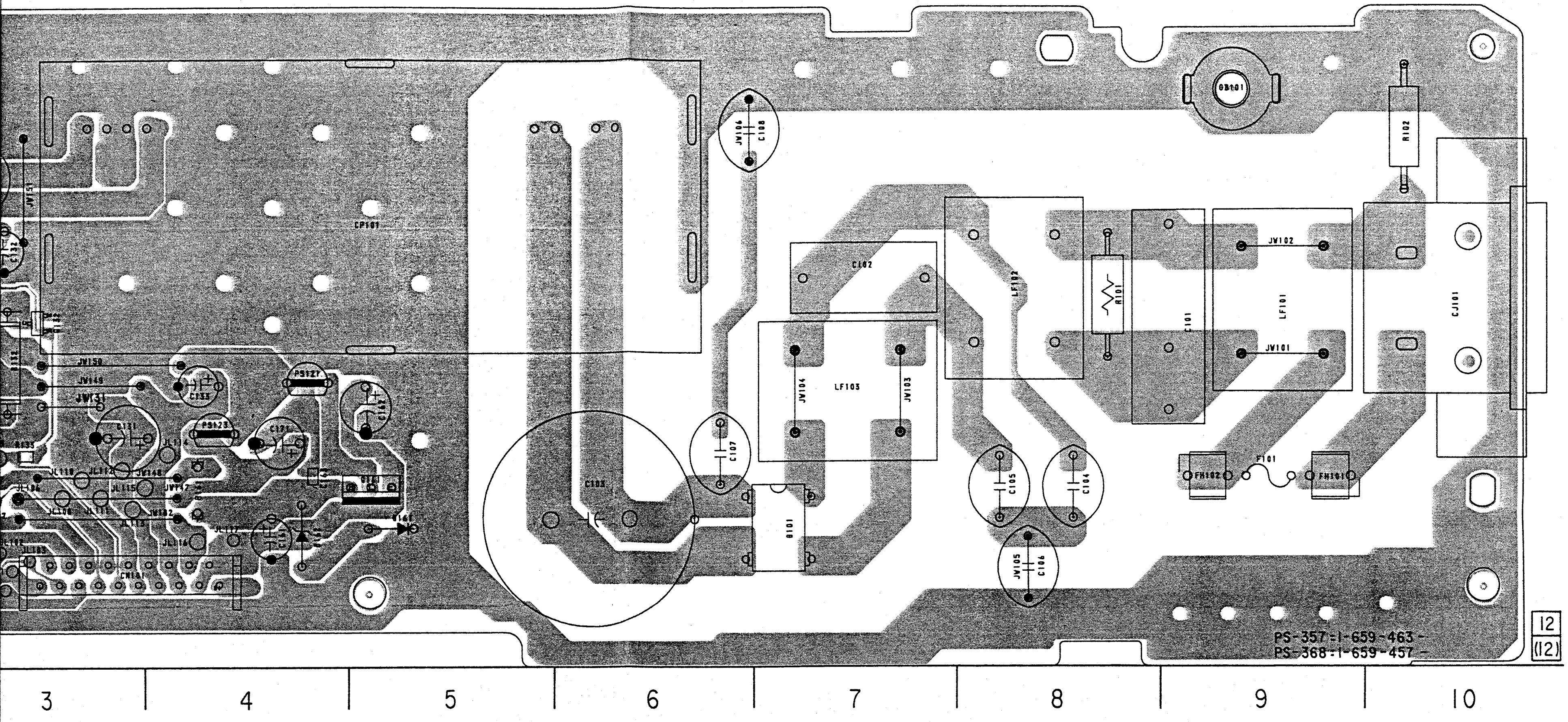
6
7
8
9
A
B
C
D
E
F
G
PS-357 BOARD (X825, X835)
PS-368 BOARD (X715, X815)
CJ101
AC IN~
F101
T2AL
250V
JW101
JW102
R101
2.7M
C101
250V
0.1:EXCEPT X825AS, X835AS
0.22:X825AS, X835AS
C112
150p
250V
EXCEPT X825AS, X835AS
LF102
C102
0.1
250V
C104
0.001
125V
C105
0.001
125V
C106
0.001
125V
LF103
D101
S1WB60
C107
0.001
125V
C108
0.001
125V
68 :X825AS, X835AS
220 :EXCEPT X825AS, X835AS
C103
250V
CP101 PS PACK
+IN
+IN
-IN
-IN
13V OUT
GND
GND
6V OUT
CASE GND
CHASSIS GND
05
PS122
ICP-N25
1A
L121
22μH
2.0A
C121
470
16V
C122
1000
10V
L122
22μH
2.0A
PS121
ICP-N25
1A
PS123
ICP-N25
1A
PS181
ICP-N10
0.4A
L181
10μH
JW183
13
C181
0.01
F
C182
47
16V


CP101
JW151
JW150
JW148
JW131
PS121
PS123
C133
C132
C131
C161
Q131
Q132
Q161
D161
D162
IC141
JL110
JL111
JL112
JL113
JL114
JL115
JL116
JL117
C108
JW106
C102
C107
C103
LF103
JW104
JW103
R101
LF102
RT101
C101
JW102
JW101
LF101
CJ101
R102
C105
C104
JW105
C106
FH102
FH101
F101
PS-357:1-659-463-
PS-368:1-659-457-
12
(12)
3
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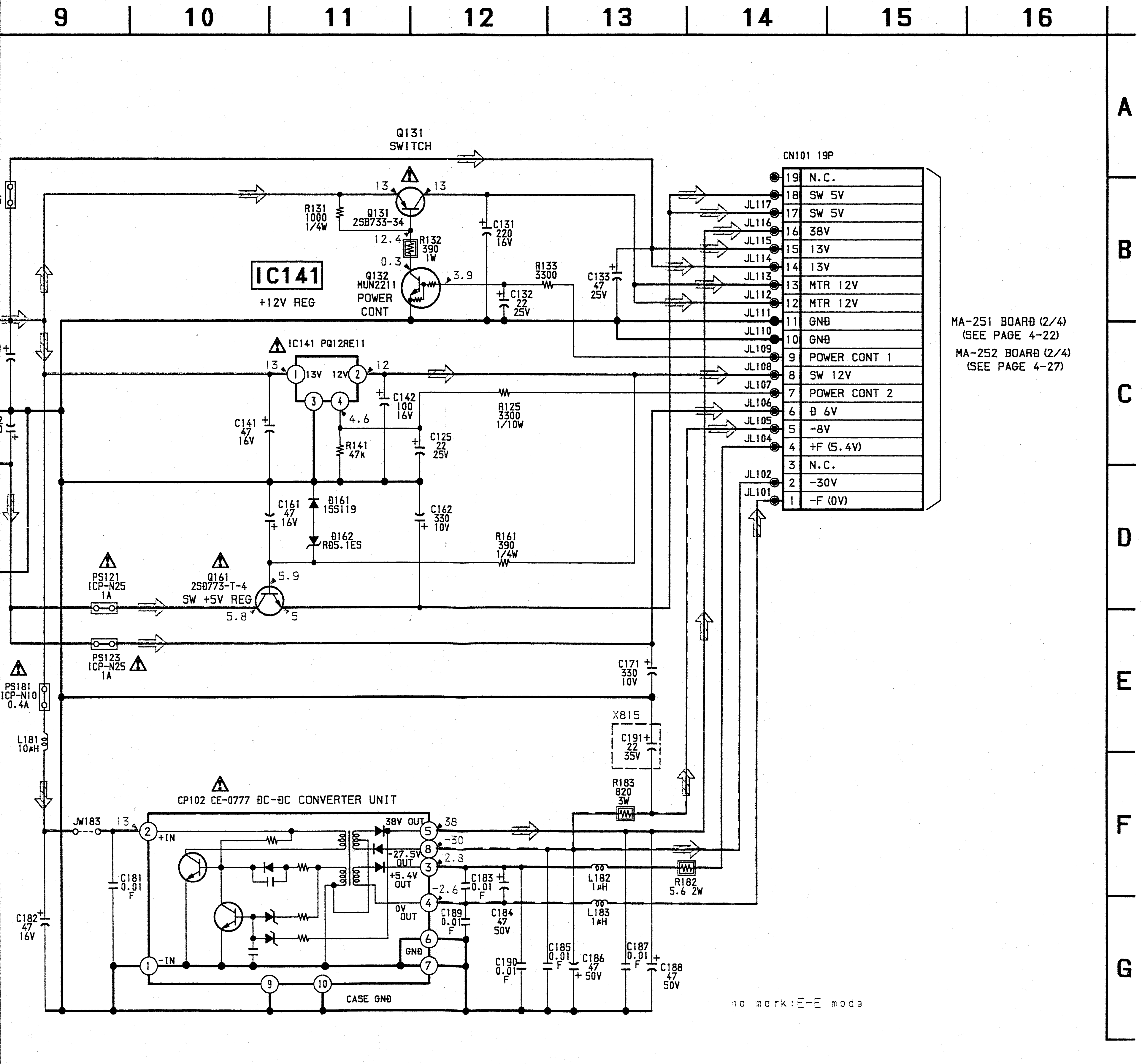
8
9
10

PS-357/368 BOARD

CN101	C-3
D101	C-7
D161	C-5
D162	C-4
IC141	B-2
Q131	B-2
Q132	B-3
Q161	C-5


9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
Q131
SWITCH
13
13
R131
1000
1/4W
Q131
2SB733-34
C131
220
16V
12.4
R132
390
1W
0.3
IC141
+12V REG
Q132
MUN2211
POWER
CONT
3.9
R133
3300
C132
22
25V
C133
47
25V
IC141 PQ12RE11
13V
12V
13
12
C142
100
16V
R125
3300
1/10W
4.6
C141
47
16V
R141
47k
C125
22
25V
C161
47
16V
D161
1SS119
D162
RD5.1ES
C162
330
10V
R161
390
1/4W
PS121
ICP-N25
1A
Q161
2SD773-T-4
SW +5V REG
5.9
5.8
5
PS123
ICP-N25
1A
PS181
ICP-N10
0.4A
L181
10µH
C171
330
10V
X815
C191
22
35V
R183
820
3W
CP102 CE-0777 DC-DC CONVERTER UNIT
JW183
13
+IN
38V OUT
38
-27.5V OUT
-30
+5.4V OUT
2.8
-2.6
0V OUT
GND
-IN
CASE GND
C181
0.01
F
C182
47
16V
C183
0.01
F
C189
0.01
F
C184
47
50V
L182
1µH
L183
1µH
R182
5.6 2W
C190
0.01
F
C185
0.01
F
C186
47
50V
C187
0.01
F
C188
47
50V
CN101 19P
JL117
JL116
JL115
JL114
JL113
JL112
JL111
JL110
JL109
JL108
JL107
JL106
JL105
JL104
JL102
JL101
19 N.C.
18 SW 5V
17 SW 5V
16 38V
15 13V
14 13V
13 MTR 12V
12 MTR 12V
11 GND
10 GND
9 POWER CONT 1
8 SW 12V
7 POWER CONT 2
6 D 6V
5 -8V
4 +F (5.4V)
3 N.C.
2 -30V
1 -F (0V)
MA-251 BOARD (2/4)
(SEE PAGE 4-22)
MA-252 BOARD (2/4)
(SEE PAGE 4-27)
no mark:E-E mode

SECTION 5
REPAIR PARTS LIST

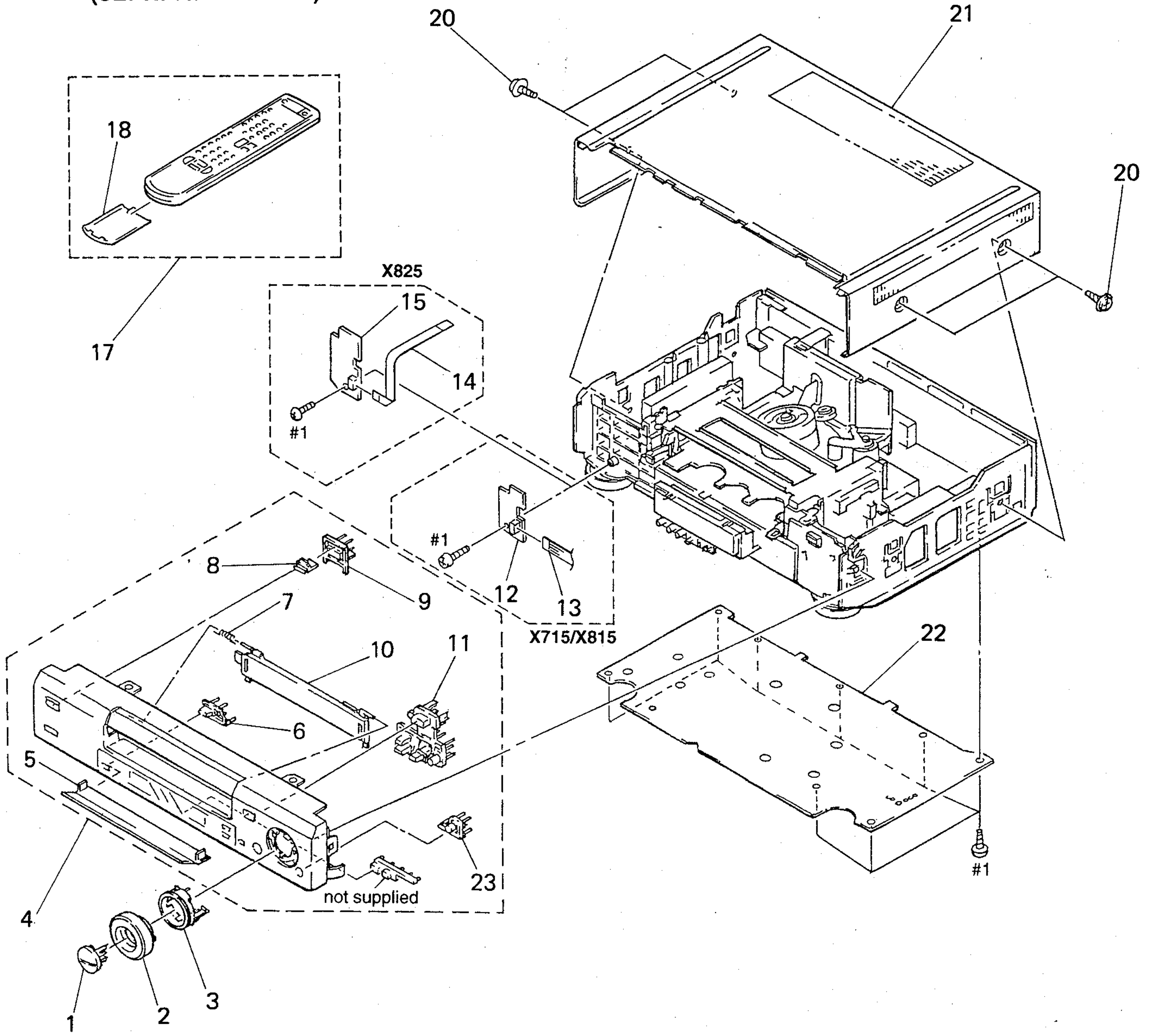
5-1. EXPLODED VIEWS

NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of the electrical parts list.

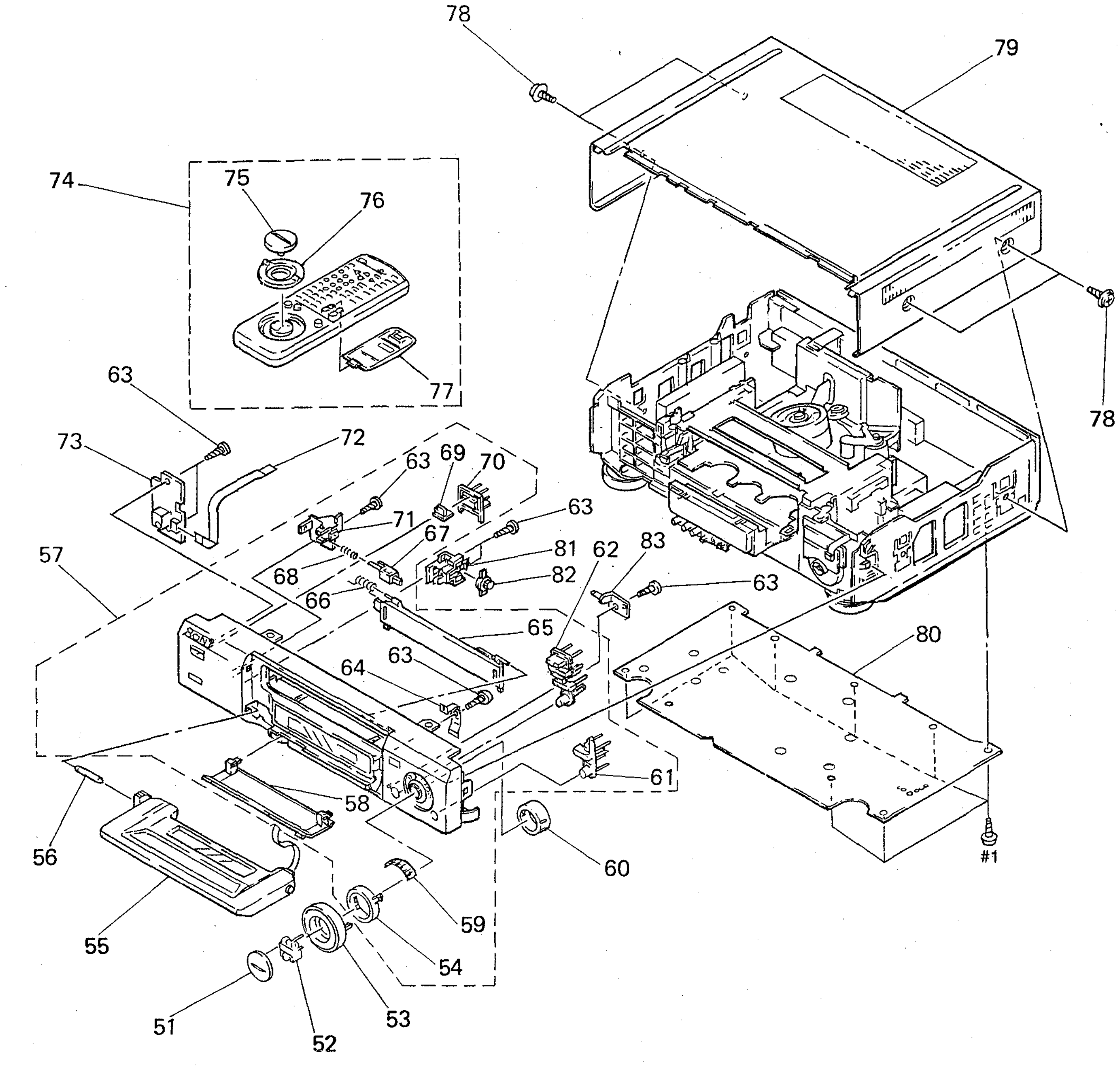
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1-1. FRONT PANEL AND CABINET ASSEMBLIES (SLV-X715/X815/X825)



Ref. No.	Part No.	Description	Remark
1	X-3945-621-1	BUTTON ASSY, FUNCTION (TITANIUM) (EXCEPT X825AS, X825MNB)	
1	X-3945-890-1	BUTTON ASSY, FUNCTION (X825AS, X825MNB)	
2	3-966-886-01	RING, SHUTTLE (TITANIUM) (EXCEPT X825AS, X825MNB)	
2	3-966-886-31	RING, SHUTTLE (X825AS, X825MNB)	
3	3-966-890-01	RING, MODE	
4	X-3945-225-1	PANEL ASSY, FRONT (X825MNB)	
4	X-3945-693-1	PANEL ASSY, FRONT (TITANIUM) (X815)	
4	X-3945-694-1	PANEL ASSY, FRONT (TITANIUM) (X825MN)	
4	X-3945-695-1	PANEL ASSY, FRONT (X825AS)	
4	X-3945-696-1	PANEL ASSY, FRONT (TITANIUM) (X825MI)	
4	X-3945-697-1	PANEL ASSY, FRONT (TITANIUM) (X715)	
5	3-966-214-41	DOOR (A), JACK (TITANIUM) (X815)	
5	3-966-214-51	DOOR (A), JACK (TITANIUM) (X825MN/MI)	
5	3-966-214-61	DOOR (A), JACK (X825AS)	
5	3-966-214-71	DOOR (A), JACK (TITANIUM) (X715)	
5	3-970-162-01	DOOR (A), JACK (X825MNB)	
6	3-966-216-01	BUTTON, TV (X825AS, X825MNB)	
6	3-966-216-11	BUTTON, TV (TITANIUM) (EXCESPT X825AS, X825MNB)	
7	3-953-432-01	SPRING (GE), FL	
8	3-946-611-01	TIP, POWER BUTTON	
9	3-966-213-01	BUTTON, POWER (X825AS, X825MNB)	
9	3-966-213-11	BUTTON, POWER (TITANIUM) (EXCEPT X825AS, X825MNB)	
10	3-966-858-11	DOOR, CASSETTE (X825AS)	
10	3-966-858-51	DOOR, CASSETTE (TITANIUM) (X715)	
10	3-966-858-81	DOOR, CASSETTE (TITANIUM) (X825MN)	
10	3-966-858-91	DOOR, CASSETTE (TITANIUM) (X815, X825MI)	
10	3-966-908-11	DOOR, CASSETTE (X825MNB)	
11	3-966-217-01	BUTTON (A), EP (X825AS, X825MNB)	
11	3-966-217-21	BUTTON (A), EP (TITANIUM) (EXCEPT X825AS, X825MNB)	
* 12	A-6782-795-A	MF-290 BOARD, COMPLETE (X715, X815)	
13	1-776-226-11	CABLE, FLAT (FHM-1) 9P (X715, X815)	
14	1-776-227-11	CABLE, FLAT (FMM-13) (X825)	
* 15	A-6782-912-A	MF-285 BOARD, COMPLETE (X825)	
17	1-473-481-21	REMOTE COMMANDER (RMT-V181L) (X825)	
17	1-473-481-31	REMOTE COMMANDER (RMT-V181M) (X815)	
17	1-473-481-41	REMOTE COMMANDER (RMT-V181N) (X715)	
18	3-709-062-01	COVER, BATTERY (V181L, V181M, V181N)	
20	3-710-901-11	SCREW, TAPPING	
* 21	3-966-225-31	CASE, UPPER (X852AS, X825MNB)	
* 21	3-966-225-71	CASE, UPPER (TITANIUM) (EXCEPT X825AS, X825MNB)	
* 22	3-966-226-01	PLATE, BOTTOM	
23	3-966-219-01	BUTTON (A), REC (X825AS, X825MNB)	
23	3-966-219-11	BUTTON (A), REC (TITANIUM) (EXCEPT X825AS, X825MNB)	

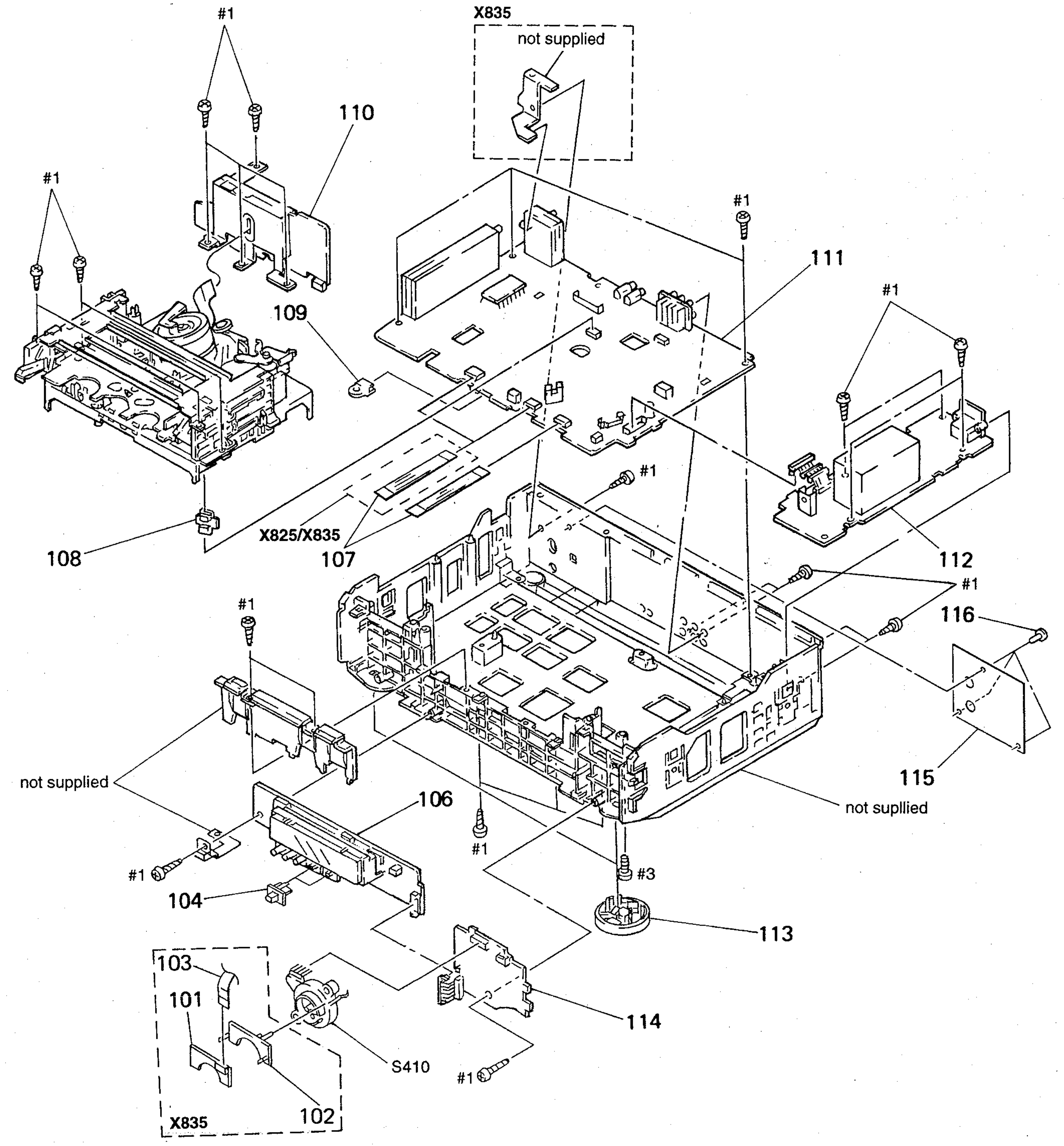
5-1-2. FRONT PANEL AND CABINET ASSEMBLIES (SLV-X835)



Ref. No.	Part No.	Description	Remark
51	3-966-252-03	BUTTON, PB/STOP (X825AS)	
51	3-966-252-33	BUTTON, PB/STOP (TITANIUM) (X825MN/ME)	
52	3-966-251-03	BASE, BUTTON	
53	3-966-253-01	RING, SHUTTLE (X835AS)	
53	3-966-253-21	RING, SHUTTLE (TITANIUM) (835MN/ME)	
54	3-966-807-01	PLAT, INDICATION, SHUTTLE	
55	1-473-518-61	SWITCH BLOCK, CONTROL (TITANIUM) (X835MN/ME)	
55	1-473-518-71	SWITCH BLOCK, CONTROL (X835AS)	
* 56	3-960-077-01	SHAFT (LEFT), FULCRUM	
57	X-3945-719-1	PANEL ASSY, FRONT (TITANIUM) (X835MN/ME)	
57	X-3945-890-1	PANEL ASSY, FRONT (X835AS)	
58	3-966-244-31	DOOR (B), JACK (TITANIUM) (X835MN/ME)	
* 58	3-966-244-41	DOOR (B), JACK (X835AS)	
59	3-966-241-01	PLATE, LIGHT GUIDE, SHUTTLE	
60	3-966-250-01	BASE, SHUTTLE RING	
61	3-966-242-01	BUTTON (B), REC (X835AS)	
61	3-966-242-31	BUTTON (B), REC (TITANIUM) (X835MN/ME)	
62	3-966-245-01	BUTTON (B), EP (X835AS)	
62	3-966-245-21	BUTTON (B), EP (TITANIUM) (X835MN/ME)	
63	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
* 64	3-960-556-01	SPRING, DOOR LOCK	

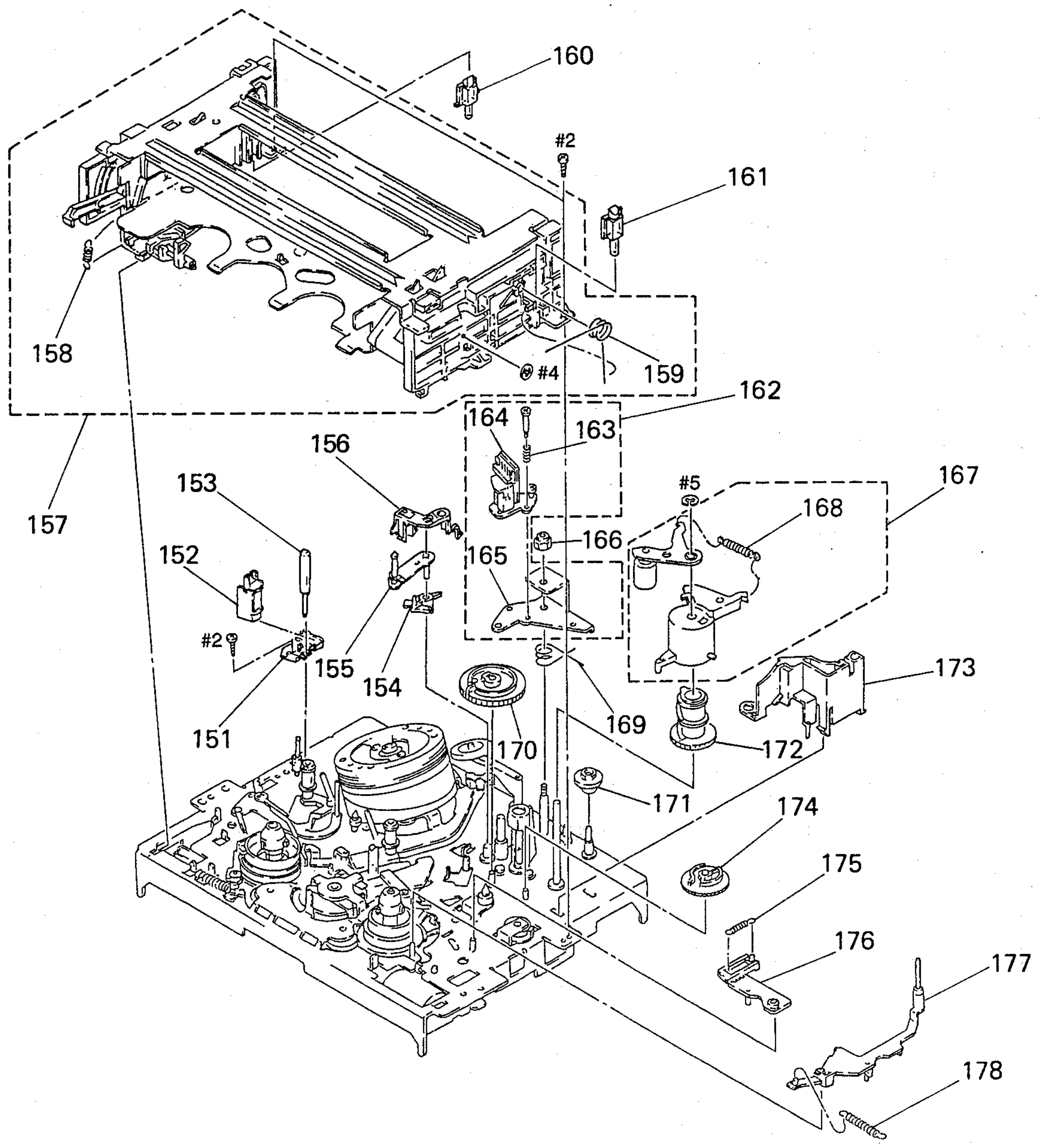
Ref. No.	Part No.	Description	Remark
65	3-960-094-01	DOOR, CASSETTE (X835AS)	
65	3-965-769-11	DOOR, CASSETTE (TITANIUM) (X835MN/ME)	
66	3-953-432-01	SPRING (GE), FL	
67	3-944-564-01	CLAW, LOCK	
68	3-957-388-01	SPRING, COMPRESSION	
69	3-946-611-01	TIP, POWER BUTTON	
70	3-966-213-01	BUTTON, POWER (X835AS)	
70	3-966-213-11	BUTTON, POWER (TITANIUM) (X835MN/ME)	
* 71	3-957-548-01	HOLDER, LOCK CLAW	
72	1-776-227-11	CABLE, FLAT (FMM-13) 7P	
* 73	A-6782-901-A	MF-285 BOARD, COMPLETE	
74	1-473-486-11	REMOTE COMMANDER (RMT-V185)	
75	X-3944-446-2	BUTTON ASSY (C) (V185)	
76	3-957-513-11	RING, SHUTTLE (V185)	
77	3-708-817-01	COVER, BATTERY (V185)	
78	3-710-901-11	SCREW, TAPPING	
* 79	3-966-255-31	CASE, UPPER (X835AS)	
* 79	3-966-255-71	CASE, UPPER (TITANIUM) (X835MN/ME)	
* 80	3-966-226-01	PLATE, BOTTOM	
* 81	3-960-076-01	PLATE (LEFT), FULCRUM, DQOR	
82	3-961-745-01	DAMPER, OIL	
83	X-3944-447-1	PLATE (RIGHT) ASSY, FULCRUM, DOOR	

5-1-3. CHASSIS ASSEMBLY



Ref. No.	Part No.	Description	Remark
* 101	A-6794-155-A	LE-13 BOARD, COMPLETE (X835)	
* 102	3-966-254-01	HOLDER, LE PC BOARD (X835)	
103	1-776-228-11	CABLE, FLAT (FDL-1) 10P (X835)	
104	3-744-217-01	KNOB, SELECTION (X715, X815, X825)	
104	3-966-255-01	KNOB (3P), SLIDE (X835)	
* 106	A-6782-906-A	HI-25 BOARD, COMPLETE (X835)	
* 106	A-6782-910-A	HI-25 BOARD, COMPLETE (X825MN, X825MNB)	
* 106	A-6782-913-A	HI-25 BOARD, COMPLETE (X825MI)	
* 106	A-6782-915-A	HI-25 BOARD, COMPLETE (X825AS)	
* 106	A-6782-917-A	HI-37 BOARD, COMPLETE (X815)	
* 106	A-6782-922-A	HI-37 BOARD, COMPLETE (X715)	
107	1-776-225-11	CABLE, FLAT (FMH-9) 15P	
* 108	A-6794-137-A	DC-70 BOARD, COMPLETE (X715, X815)	
* 108	A-6794-137-A	DC-78 BOARD, COMPLETE (X825, X835)	
* 109	3-966-237-01	HOLDER (ST), MA	
* 110	A-6782-902-A	RP-199 BOARD, COMPLETE (X825, X835)	
* 110	A-6782-918-A	RP-203 BOARD, COMPLETE (X815)	
* 110	A-6782-923-A	RP-203 BOARD, COMPLETE (X715)	
* 111	A-6782-903-A	MA-251 BOARD, COMPLETE (X835MN/ME)	
* 111	A-6782-907-A	MA-251 BOARD, COMPLETE (X835AS)	
* 111	A-6782-911-A	MA-251 BOARD, COMPLETE (X825MN, X825MNB)	
* 111	A-6782-914-A	MA-251 BOARD, COMPLETE (X825MI)	
* 111	A-6782-916-A	MA-251 BOARD, COMPLETE (X825AS)	
* 111	A-6782-919-A	MA-252 BOARD, COMPLETE (X815PS)	
* 111	A-6782-920-A	MA-252 BOARD, COMPLETE (X815ME)	
* 111	A-6782-921-A	MA-252 BOARD, COMPLETE (X815SG)	
* 111	A-6782-924-A	MA-252 BOARD, COMPLETE (X715PS)	
* 111	A-6782-925-A	MA-252 BOARD, COMPLETE (X715ME)	
* 111	A-6782-926-A	MA-252 BOARD, COMPLETE (X715SG)	
* 112	A-6782-819-A	PS-368 BOARD, COMPLETE (X815)	
* 112	A-6782-820-A	PS-368 BOARD, COMPLETE (X715)	
* 112	A-6782-905-A	PS-357 BOARD, COMPLETE (X825MN/MNB/MI, X835MN/ME)	
* 112	A-6782-908-A	PS-357 BOARD, COMPLETE (X825AS, X835AS)	
113	3-966-229-01	INSULATOR (ST) (X825AS, X825MNB, X835AS)	
113	3-966-229-31	INSULATOR (ST) (TITANIUM) (X715, X815, X825MN/MI, X835MN/ME)	
* 114	A-6782-818-A	DM-52 BOARD, COMPLETE (X715, X815)	
* 114	A-6782-904-A	DM-49 BOARD, COMPLETE (X835)	
* 114	A-6782-909-A	DM-49 BOARD, COMPLETE (X825)	
* 115	3-968-136-01	PLATE (TU), JACK, REAR (X825MN/MNB/MI, X835)	
* 115	3-968-136-11	PLATE (TU), JACK, REAR (X825AS)	
* 115	3-968-136-21	PLATE (TU), JACK, REAR (X715, X815)	
116	3-531-576-11	RIVET	
S410	1-572-662-12	SWITCH, ROTARY (DUAL MODE SHUTTLE)	

5-1-4. MECHANISM CHASSIS ASSEMBLY (1)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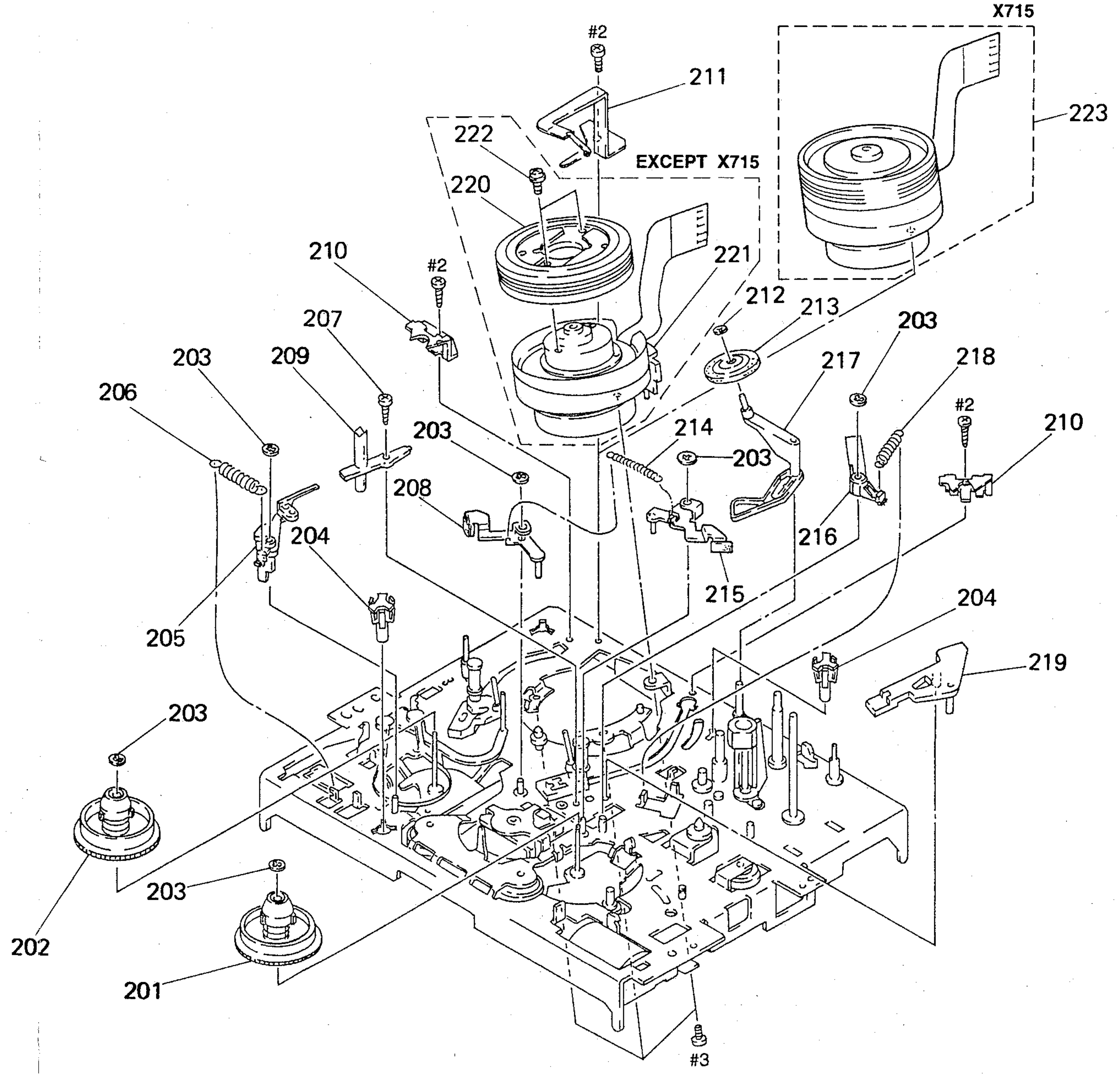
Ref. No.	Part No.	Description	Remark
151	X-3945-348-1	FEH ASSY	
152	1-500-144-11	HEAD, FE	
153	X-3944-460-1	ROLLER ASSY, TG2	
154	3-958-421-01	HOLDER, TG8	
155	X-3944-797-1	TG8 ASSY	
156	3-962-298-01	BRACKET, TG7 TAPE	
157	A-6751-496-C	FL BLOCK ASSY	
158	3-958-467-01	SPRING, TENSION COIL	
159	3-958-195-01	SPRING, TORSION	
160	3-960-215-01	PLATE, LIGHT GUIDE, END SENSOR	
161	3-960-216-01	PLATE, LIGHT GUIDE, TOP SENSOR	
162	A-6736-103-A	ACE BLOCK ASSY	
163	3-960-439-02	SPRING (ACE), COMPRESSION	
164	1-506-485-11	PIN, CONNECTOR 6P	

Ref. No.	Part No.	Description	Remark
165	3-958-491-01	BASE, ACE	
166	3-942-867-01	NUT, AC HEIGHT ADJUSTMENT	
167	A-6746-072-A	PRESS BLOCK ASSY, PINCH	
168	3-958-455-01	SPRING (PINCH), TENSION	
169	3-958-487-01	SPRING, (AEC) TORSION COIL	
170	3-958-152-01	GEAR, TG8	
171	3-958-501-01	SCREW, ACE ADJUSTMENT	
172	3-958-151-01	GEAR, ELEVATOR	
173	3-958-454-01	OPNER, LID	
174	3-958-153-01	GEAR, PRESS	
175	3-958-462-01	SPRING (RVS BRAKE), TENSION	
176	X-3943-885-1	ARM ASSY, RVS BRAKE	
177	X-3943-882-1	BRAKE (T) ASSY, SOFT	
178	3-958-505-01	SPRING (SOFT BRAKE T), TENSION	

5-1-5. MECHANISM CHASSIS ASSEMBLY (2)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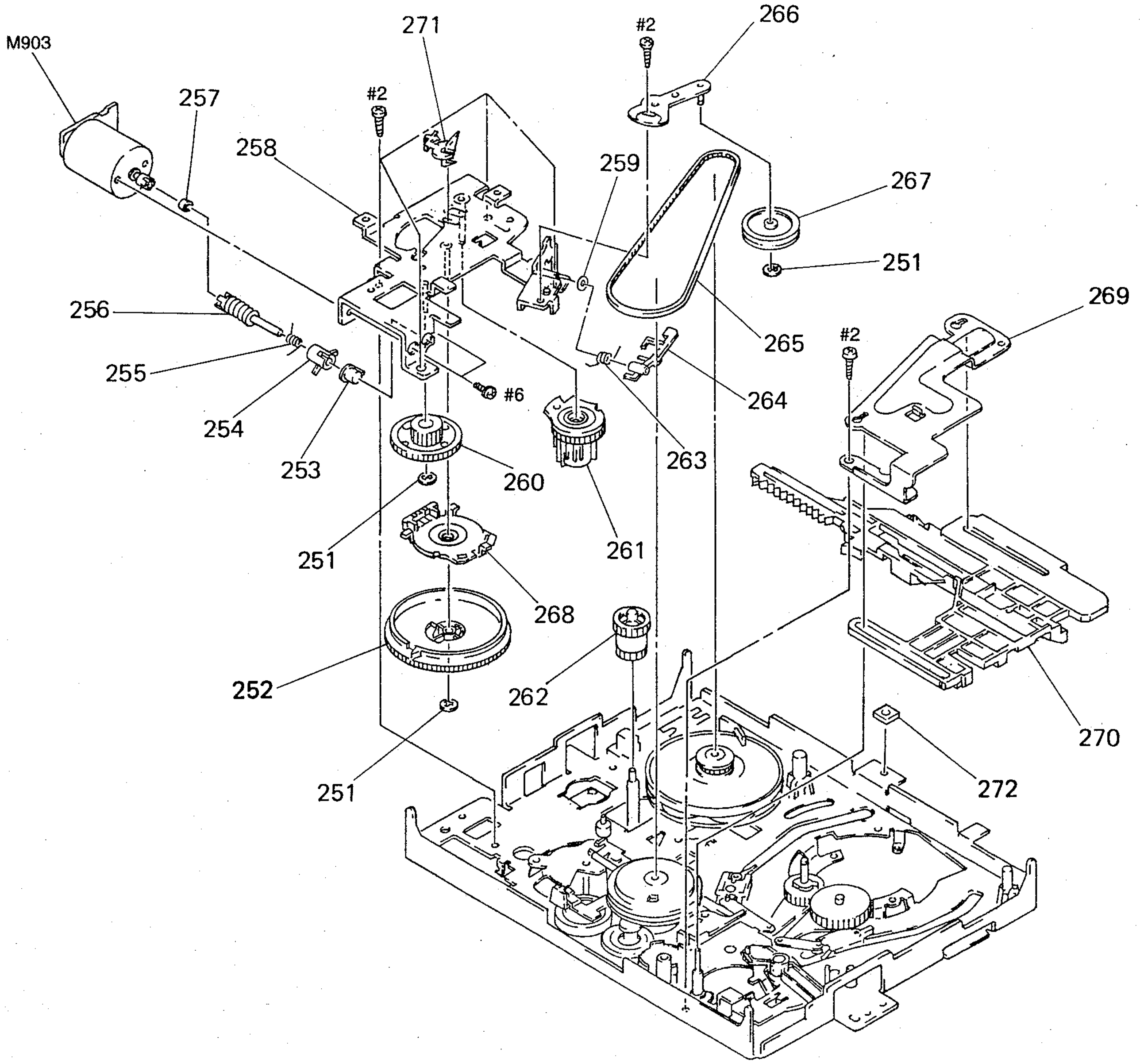
Ref. No.	Part No.	Description	Remark
201	X-3943-903-1	TABLE, REEL (T) ASSY	
202	X-3943-902-1	TABLE, REEL (S) ASSY	
203	3-669-595-00	WASHER (2), STOPPER	
204	3-958-390-01	SHAFT, PC BOARD	
205	3-958-450-01	BRAKE (S), SOFT	
206	3-958-443-01	SPRING, STRETCH COIL SPRING	
207	3-961-441-01	SCREW (3X8)	
208	X-3945-650-1	BRAKE (S) ASSY, MAIN	
209	3-958-391-01	PLATE, LIGHT GUIDE, LED	
210	3-958-389-01	CATCHER	
211	X-3943-899-5	GROUND ASSY, SHAFT	
212	3-321-393-01	WASHER, STOPPER	

Ref. No.	Part No.	Description	Remark
213	X-3944-363-1	ROLLER ASSY, HC	
214	3-958-517-01	SPRING, TENSIONCOIL	
215	X-3945-651-1	ARM (T) ASSY, MAIN BRAKE	
216	3-960-139-01	ARM, NEUTRALITY	
217	X-3943-896-1	ARM ASSY, HC	
218	3-958-535-01	SPRING, TENSION	
219	3-960-138-01	ARM, PENDULUM COMPULSION	
220	8-848-623-02	DRUM ASSY, ROTARY UPPER (DZR-67-R)	(X815, X825, X835)
221	8-848-666-11	DRUM ASSY, LOWER (DZR-51/J-RP)	(X815, X825, X835)
222	2-643-205-01	SCREW, +PW 3X8	
223	8-848-682-11	DRUM ASSY (DZH-74B/Q-RP) (X715)	

5-1-6. MECHANISM CHASSIS ASSEMBLY (3)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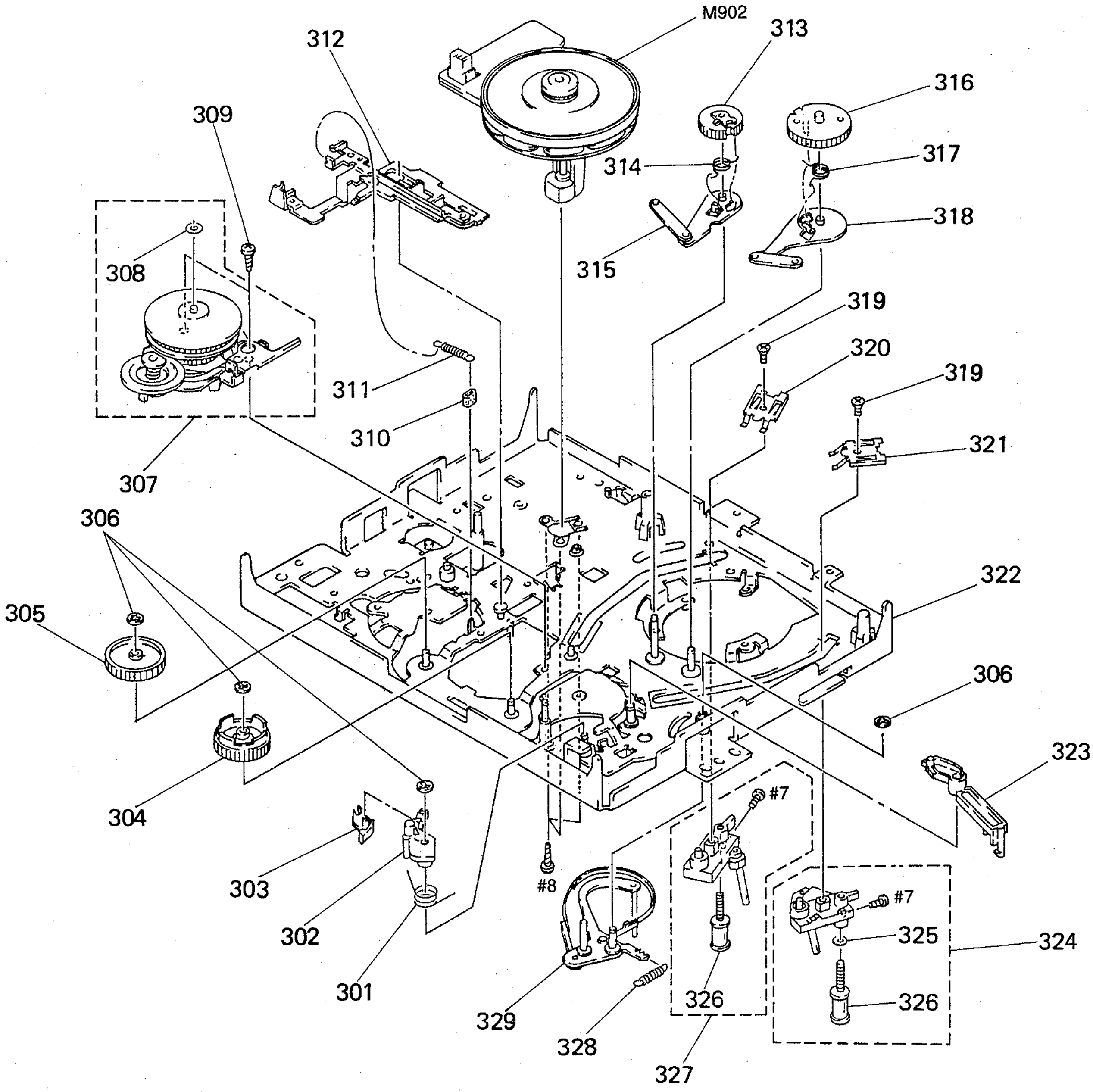
Ref. No.	Part No.	Description	Remark
251	3-669-595-00	WASHER (2), STOPPER	
252	3-958-161-04	GEAR, CAM	
253	3-958-155-01	BEARING, CAM MOTOR	
254	3-958-160-01	PROPELLOR	
255	3-958-460-01	SPRING, ONE-WAY	
256	3-958-159-01	WORM	
257	3-959-840-11	RUBBER, JOINT	
* 258	X-3943-884-1	CHASSIS ASSY, CAM MOTOR	
259	3-701-439-21	WASHER	
260	3-958-157-01	WHEEL, WORM	
261	3-958-156-02	GEAR, FL DRIVING	
262	3-958-162-01	GEAR, UPPER/LOWER COMMUNICATION	
263	3-958-445-01	SPRING, TORSIONCOIL (CAP BRAKE)	
264	X-3943-888-1	BRAKE ASSY, CAP	
265	3-958-361-01	BELT, TIMING	
266	X-3943-889-1	ARM ASSY, TENSION VEHICLE	
267	3-958-448-01	WHEEL, TENSION	
268	1-762-076-11	SWITCH, ROTARY	
* 269	3-959-763-01	RETAINER	
270	3-958-163-04	SLIDER, MAIN	
271	3-965-977-01	RETAINER, CAM GEAR	
272	3-965-923-01	SPACER, RUBBER	
M903	X-3943-883-1	MOTOR ASSY, CAM	

5-1-7. MECHANISM CHASSIS ASSEMBLY (4)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Ref. No.	Part No.	Description	Remark
301	3-958-534-01	SPRING, TORSION	
302	3-958-532-01	ARM, S WINDING	
303	3-958-533-01	CLAW, S WINDING	
304	3-962-959-01	GEAR (S-K), IDLER	
305	3-962-960-01	GEAR (T-K), IDLER	
306	3-669-595-00	WASHER (2), STOPPER	
307	A-6739-102-A	RKB BLOCK ASSY	
308	3-966-092-01	RING, RETAINING, SLIT WASHER	
309	3-961-441-01	SCREW (3X8)	
310	3-959-840-11	RUBBER, JOINT	
311	3-958-529-01	SPRING (MOMENT), TENSION	
312	X-3943-897-1	LEVER ASSY, TRIGGER	
313	3-958-485-02	GEAR (T), LOADING	
314	3-960-449-01	SPRING (T), TORSION COIL	
315	X-3943-891-1	LEVER (T) ASSY, LOADING	
316	3-958-476-01	GEAR (S), LOADING	
317	3-960-448-01	SPRING (S), TORSION COIL	
318	X-3943-890-1	LEVER (S) ASSY, LOADING	
319	3-960-720-01	SCREW	
320	3-960-688-01	SPRING, LEAF (T), LOADING	
321	3-960-687-01	SPRING, LEAF (S), LOADING	
322	X-3945-485-1	CHASSIS ASSY, MECHANICAL	
323	3-958-504-01	ARM, FIXED RELEASE	
324	A-6750-316-A	SHUTTLE (S) BLOCK ASSY	
325	3-962-874-01	O-RING	
326	X-3944-378-1	ROLLER ASSY, GUIDE	
327	A-6750-314-A	T BLOCK ASSY, SHUTTLE	
328	3-958-492-01	SPRING (TG1), TENSION COIL	
329	X-3943-886-1	TG1 ASSY	
M902	1-698-409-11	MOTOR, DC SCV-0801A/Z-NP (CAPSTAN)	

5-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark
	A-6794-137-A	DC-70 BOARD, COMPLETE (X825,X835)	
	A-6794-137-A	DC-78 BOARD, COMPLETE (X715,X815)	
		*********************	
			(Ref.No. 1,000 Series)
		< CONNECTOR >	
* CN001	1-766-714-11	CONNECTOR, BOARD TO BOAR 5P	
* CN002	1-766-713-11	CONNECTOR, BOARD TO BOAR 5P	
*	A-6782-909-A	DM-49 BOARD, COMPLETE (X825)	
*	A-6782-904-A	DM-49 BOARD, COMPLETE (X835)	
		*********************	
			(Ref.No. 1,000 Series)
		< CAPACITOR >	
C401	1-163-038-91	CERAMIC CHIP 0.1uF 25V	(X835)
C402	1-126-933-11	ELECT 100uF 20% 10V	(X835)
C405	1-163-181-00	CERAMIC CHIP 100PF 5% 50V	(X835)
		< CONNECTOR >	
CN401	1-568-665-11	CONNECTOR, BOARD TO BOARD 11P	
CN402	1-580-850-11	CONNECTOR (DMS) 8P	
CN403	1-695-371-31	CONNECTOR, FFC/FPC 10P	(X835)
		< IC >	
IC401	8-759-366-45	IC NJU3713G(TE2)	(X835)
		< RESISTOR >	
R401	1-216-033-00	METAL CHIP 220 5% 1/10W	(X835)
R402	1-216-033-00	METAL CHIP 220 5% 1/10W	(X835)
R403	1-216-033-00	METAL CHIP 220 5% 1/10W	(X835)
R404	1-216-033-00	METAL CHIP 220 5% 1/10W	(X835)
R405	1-216-033-00	METAL CHIP 220 5% 1/10W	(X835)
R406	1-216-033-00	METAL CHIP 220 5% 1/10W	(X835)
R407	1-216-033-00	METAL CHIP 220 5% 1/10W	(X835)
R408	1-216-033-00	METAL CHIP 220 5% 1/10W	(X835)
R409	1-216-049-91	METAL GLAZE 1K 5% 1/10W	(X835)
R410	1-216-049-91	METAL GLAZE 1K 5% 1/10W	(X835)
R411	1-216-198-91	METAL GLAZE 1K 5% 1/8W	(X835)
R412	1-216-049-91	METAL GLAZE 1K 5% 1/10W	(X835)
R413	1-247-815-91	CARBON 220 5% 1/4W	(X835)
R414	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R415	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R416	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R417	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R420	1-216-222-00	METAL GLAZE 10K 5% 1/8W	
		< SWITCH >	
S401	1-571-977-11	SWITCH, TACTIL (● REC)	(X825)
S402	1-571-977-11	SWITCH, TACTIL (● REC)	(X835)
S403	1-571-977-11	SWITCH, TACTIL (❚❚ PAUSE)	
S404	1-571-977-11	SWITCH, TACTIL (⏏ EJECT)	(X835)
S405	1-571-977-11	SWITCH, TACTIL (⏏ EJECT)	(X825)
S410	1-572-662-12	SWITCH, ROTARY (DUAL MODE SHUTTLE)	
*	A-6782-818-A	DM-52 BOARD, COMPLETE (X715,X815)	
		*********************	
			(Ref.No. 2,000 Series)
		< CONNECTOR >	
CN401	1-770-031-11	CONNECTOR, BOARD TO BOARD 7P	
CN402	1-580-850-11	CONNECTOR (DMS) 8P	
		< DIODE >	
D401	8-719-911-19	DIODE 1SS119-25	
D402	8-719-911-19	DIODE 1SS119-25	
D403	8-719-911-19	DIODE 1SS119-25	
D404	8-719-911-19	DIODE 1SS119-25	
D405	8-719-911-19	DIODE 1SS119-25	
D406	8-719-911-19	DIODE 1SS119-25	
		< SWITCH >	
S401	1-571-977-11	SWITCH, TACTIL (❚❚ PAUSE)	
S406	1-571-977-11	SWITCH, TACTIL (● REC)	
S407	1-571-977-11	SWITCH, TACTIL (⏏ EJECT)	
S410	1-572-662-11	SWITCH, ROTARY (DUAL MODE SHUTTLE)	

HI-25

Ref. No.	Part No.	Description	Remark
*	A-6782-915-A	HI-25 BOARD, COMPLETE (X825AS)	
*	A-6782-913-A	HI-25 BOARD, COMPLETE (X825MI)	
*	A-6782-910-A	HI-25 BOARD, COMPLETE (X825MN/MNB)	
*	A-6782-906-A	HI-25 BOARD, COMPLETE (X835)	
		**********************	
		(Ref. No. 1,000 Series)	
	3-966-234-01	HOLDER (A), FL (X825)	
	3-966-257-01	HOLDER (B), FL (X835)	
		< CAPACITOR >	
C302	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C305	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C307	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C311	1-163-035-00	CERAMIC CHIP 0.047uF 50V	(X825)
		< CONNECTOR >	
CN301	1-774-461-11	CONNECTOR, FFC/FPC 15P	
CN302	1-506-484-11	PIN, CONNECTOR 5P	
CN303	1-774-461-11	CONNECTOR, FFC/FPC 15P	
CN304	1-774-461-11	CONNECTOR, FFC/FPC 15P	
CN305	1-568-671-11	CONNECTOR, BOARD TO BOARD 11P	
CN306	1-691-036-21	PIN, CONNECTOR (PC BOARD) 4P	(X835)
		< DIODE >	
D301	8-719-108-12	DIODE RD9.1EW	
D302	8-719-109-81	DIODE RD4.7ES-B2	
D303	8-719-108-12	DIODE RD9.1EW	
D304	8-719-108-12	DIODE RD9.1EW	
D306	8-719-110-08	DIODE RD8.2ES-B2	
		< FILTER >	
FL301	1-517-476-11	TUBE, FLUORESCENT INDICATOR	(X825AS/MN/MNB, X835)
FL301	1-517-479-11	TUBE, FLUORESCENT INDICATOR	(X825MI)
		< IC >	
IC301	1-466-833-11	IC RAY-CATCHER BLOCK, REMOCON	(X825)
		< JUMPER RESISTOR >	
JR002	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR003	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR004	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR005	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR006	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR007	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR008	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR307	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR309	1-216-296-00	METAL CHIP 0 5% 1/8W	(X825MI/MN/MNB, X835)
		< JACK >	
PJ301	1-774-509-11	JACK, PIN (3P) (LINE-2 IN)	(X825)
PJ301	1-766-861-11	JACK, PIN (3P) (LINE-2 IN)	(X835)
		< RESISTOR >	
R301	1-216-022-00	METAL CHIP 75 5% 1/10W	
R302	1-216-295-00	METAL CHIP 0 5% 1/10W	
R303	1-216-295-00	METAL CHIP 0 5% 1/10W	(X825AS)
R304	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R308	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R309	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R310	1-249-429-11	CARBON 10K 5% 1/4W	
R311	1-249-429-11	CARBON 10K 5% 1/4W	
R312	1-216-073-00	METAL CHIP 10K 5% 1/10W	(X825AS)
R313	1-216-057-00	METAL CHIP 4.7K 5% 1/10W	(X825)
R314	1-249-428-11	CARBON 8.2K 5% 1/4W	(X825)
R315	1-216-057-00	METAL CHIP 3.3K 5% 1/10W	(X825)
R318	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	(X825)
R319	1-216-061-00	METAL CHIP 2.2K 5% 1/10W	(X825)
R320	1-216-065-00	METAL CHIP 2.2K 5% 1/10W	(X825)
R321	1-216-073-00	METAL CHIP 10K 5% 1/10W	(X825)
R324	1-216-081-00	METAL CHIP 22K 5% 1/10W	(X825MI/MN/MNB, X835)
R325	1-216-081-00	METAL CHIP 22K 5% 1/10W	(X825MI/MN/MNB, X835)
R327	1-216-089-91	METAL GLAZE 47K 5% 1/10W	(X825)
R329	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	(X835)
R330	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	(X835)
		< SWITCH >	
S301	1-572-908-11	SWITCH, SLIDE (RENTAL PICTURE)	
S302	1-572-907-11	SWITCH, SLIDE (COLOR SYSTEM)	(X825MI/MN/MNB, X835)
S304	1-571-977-11	SWITCH, TACTIL (RF CHANNEL)	(X835)
S305	1-571-977-11	SWITCH, TACTIL (TV/VTR)	(X825)
S306	1-571-977-11	SWITCH, TACTIL (RF CHANNEL)	(X825)
S309	1-571-977-11	SWITCH, TACTIL (PROGRAM +)	(X825)
S310	1-571-977-11	SWITCH, TACTIL (PROGRAM -)	(X825)
S311	1-571-977-11	SWITCH, TACTIL (INPUT SELECT)	(X825)
S312	1-571-977-11	SWITCH, TACTIL (EASY SET UP)	

HI-37

Ref. No.	Part No.	Description	Remark
*	A-6782-922-A	HI-37 BOARD, COMPLETE (X715)	
*	A-6782-917-A	HI-37 BOARD, COMPLETE (X815)	
		********************	
		(Ref. No. 2,000 Series)	
	3-966-234-01	HOLDER (A), FL	
		< CAPACITOR >	
C302	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	(X815)
C305	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C307	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C309	1-214-589-11	ELECT 47uF 20% 16V	
C310	1-163-059-11	CERAMIC CHIP 0.01uF 10% 50V	
C313	1-163-035-11	CERAMIC CHIP 0.047uF 50V	
		< CONNECTOR >	
CN301	1-774-461-11	CONNECTOR, FFC/FPC 15P	
CN302	1-506-483-21	PIN, CONNECTOR 4P	(X715)
CN302	1-506-484-11	PIN, CONNECTOR 5P	(X815)
CN303	1-691-068-21	HOUSING, CONNECTOR 9P	
* CN304	1-691-406-11	CONNECTOR, BOARD TO BOARD 7P	
		< DIODE >	
D301	8-719-108-12	DIODE RD9.1E-W	(X815)
D302	8-719-109-81	DIODE RD4.7ES-B2	(X815)
D303	8-719-108-12	DIODE RD9.1E-W	(X815)
D304	8-719-108-12	DIODE RD9.1E-W	
D305	8-719-911-19	DIODE 1SS119-25	
D306	8-719-911-19	DIODE 1SS119-25	
D307	8-719-911-19	DIODE 1SS119-25	
D308	8-719-911-19	DIODE 1SS119-25	
D309	8-719-911-19	DIODE 1SS119-25	
D310	8-719-911-19	DIODE 1SS119-25	
D311	8-719-911-19	DIODE 1SS119-25	
D314	8-719-911-19	DIODE 1SS119-25	
D320	8-719-911-19	DIODE 1SS119-25	
D321	8-719-110-08	DIODE RD8.2ES-B2	
D322	8-719-911-19	DIODE 1SS119-25	
D324	8-719-911-19	DIODE 1SS119-25	
		< FLUORESCENT INDICATOR TUBE >	
FL301	1-517-478-11	TUBE, FLUORESCENT INDICATOR	
		< IC >	
IC301	8-759-366-44	IC uPD16312GB-3B4	
IC302	8-466-833-11	IC RAY-CATCHER BLOCK, REMOCON	
		< JUMPER RESISTOR >	
JR001	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR301	1-216-295-00	METAL CHIP 0 5% 1/10W	(X715)
JR302	1-216-296-00	METAL CHIP 0 5% 1/10W	
JR303	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR304	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR305	1-216-295-00	METAL CHIP 0 5% 1/10W	
		< COIL >	
L303	1-410-509-11	INDUCTOR 10uH	
		< JACK >	
PJ301	1-774-510-11	JACK, PIN 2P (LINE-2 IN)	(X715)
PJ301	1-774-509-11	JACK, PIN 3P (LINE-2 IN)	(X815)
		< RESISTOR >	
R301	1-216-022-00	METAL CHIP 75 5% 1/10W	
R302	1-216-295-00	METAL CHIP 0 5% 1/10W	(X815)
R303	1-216-295-00	METAL CHIP 0 5% 1/10W	
R304	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R306	1-249-435-11	CARBON 33K 5% 1/4W	
R307	1-249-425-11	CARBON 4.7K 5% 1/4W	
R308	1-216-295-00	METAL CHIP 0 5% 1/10W	
R309	1-216-049-91	METAL CHIP 1K 5% 1/10W	
R310	1-216-049-91	METAL CHIP 1K 5% 1/10W	
R311	1-216-049-91	METAL CHIP 1K 5% 1/10W	
R312	1-216-295-00	METAL CHIP 0 5% 1/10W	
R313	1-216-295-00	METAL CHIP 0 5% 1/10W	
R314	1-216-295-00	METAL CHIP 0 5% 1/10W	
R315	1-216-295-00	METAL CHIP 0 5% 1/10W	
R316	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R317	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R318	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R319	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R327	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
		< SWITCH >	
S301	1-572-907-11	SWITCH, SLIDE (COLOR SYSTEM)	
S302	1-572-908-11	SWITCH, SLIDE (RENTAL PICTURE)	
S304	1-571-977-11	SWITCH, TACTIL (PROGRAM -)	
S305	1-571-977-11	SWITCH, TACTIL (PROGRAM +)	
S306	1-571-977-11	SWITCH, TACTIL (INPUT SELECT)	
S307	1-571-977-11	SWITCH, TACTIL (COUNTER RESET)	
S308	1-571-977-11	SWITCH, TACTIL (TAPE SPEED)	

LE-13 **MA-251**

Ref. No.	Part No.	Description	Remark
*	A-6794-155-A	LE-13 BOARD, COMPLETE (X835)	

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(Ref. No. 1,000 Series)

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN601	1-691-069-11	HOUSING, CONNECTOR 10P (X835)	

< LED >

Ref. No.	Part No.	Description	Remark
D601	8-719-056-07	LED SLR-342MC3F (REW) (X835)	
D602	8-719-056-07	LED SLR-342MC3F (REW) (X835)	
D603	8-719-056-07	LED SLR-342MC3F (REW) (X835)	
D604	8-719-056-07	LED SLR-342MC3F (REW) (X835)	
D605	8-719-056-06	LED SLR-342DC3F (PLAY/FF/REW) (X835)	
D606	8-719-056-07	LED SLR-342MC3F (PLAY/FF) (X835)	
D607	8-719-056-07	LED SLR-342MC3F (PLAY/FF) (X835)	
D608	8-719-056-07	LED SLR-342MC3F (FF) (X835)	
D609	8-719-056-07	LED SLR-342MC3F (FF) (X835)	

Ref. No.	Part No.	Description	Remark
*	A-6782-916-A	MA-251 BOARD, COMPLETE (X825AS)	
*	A-6782-914-A	MA-251 BOARD, COMPLETE (X825MI)	
*	A-6782-911-A	MA-251 BOARD, COMPLETE (X825MN/MNB)	
*	A-6782-907-A	MA-251 BOARD, COMPLETE (X835AS)	
*	A-6782-903-A	MA-251 BOARD, COMPLETE (X835ME/MN)	

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(Ref. No. 3,000 Series)

Ref. No.	Part No.	Description	Remark
*	3-960-273-01	SPACER, TOP END	
*	3-960-274-01	SPACER, LED	

< BUZZER >

Ref. No.	Part No.	Description	Remark
BZ151	1-529-104-11	BUZZER, PIEZOELECTRIC	

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C101	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C102	1-126-967-11	ELECT	47uF	20%	16V
C103	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C104	1-124-234-00	ELECT	22uF	20%	16V
C105	1-124-584-00	ELECT	100uF	20%	10V
C106	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C107	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C108	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C109	1-124-257-00	ELECT	2.2uF	20%	50V
C111	1-124-257-00	ELECT	2.2uF	20%	50V
C114	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C151	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C152	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C153	1-164-346-11	CERAMIC CHIP	1uF		16V
C154	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C155	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C156	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C157	1-164-346-11	CERAMIC CHIP	1uF	10%	16V
C158	1-128-057-11	ELECT	330uF	20%	6.3V
C159	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C160	1-125-507-11	CAPACITOR	0.22F		5.5V
C161	1-128-057-11	ELECT	330uF	20%	6.3V
C162	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C163	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C164	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C165	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C166	1-126-916-11	ELECT	1000uF	20%	6.3V
C201	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C202	1-164-346-11	CERAMIC CHIP	1uF		16V
C203	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C204	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C205	1-163-081-00	CERAMIC CHIP	0.22uF		25V
C206	1-164-346-11	CERAMIC CHIP	1uF		16V
C207	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C208	1-124-584-00	ELECT	100uF	20%	10V
C209	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C252	1-162-638-11	CERAMIC CHIP	1uF		16V
C253	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C254	1-124-589-11	ELECT	47uF	20%	16V
C255	1-130-489-00	MYLAR	0.033uF	5%	50V
C256	1-137-441-11	FILM	0.027uF	5%	50V
C261	1-126-176-11	ELECT	220uF	20%	10V
C262	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C264	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C266	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C267	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C273	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C275	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C291	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C292	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C294	1-124-455-00	ELECT	100uF	20%	16V
C295	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C296	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C297	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C301	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C302	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C304	1-124-589-11	ELECT	47uF	20%	16V
C305	1-124-589-11	ELECT	47uF	20%	16V(960)
C306	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C307	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C308	1-126-964-11	ELECT	10uF	20%	50V
C309	1-124-589-11	ELECT	47uF	20%	16V
C310	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V

(X825MI/MN/MNB, X835)

Ref. No.	Part No.	Description			Remark
C312	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C331	1-163-124-00	CERAMIC CHIP	200PF	5%	50V
			(X825MI/MN/MNB, X835)		
C351	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
			(X825MI/MN/MNB, X835)		
C352	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C353	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C354	1-124-589-11	ELECT	47uF	20%	16V
C356	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C357	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C358	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C359	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C360	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C401	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C402	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C404	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
			(X825MI/MN/MNB, X835ME/MN)		
C405	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
			(X825MI/MN/MNB, X835ME/MN)		
C406	1-124-589-11	ELECT	47uF	20%	16V
C407	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C408	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C409	1-124-589-11	ELECT	47uF	20%	16V
C410	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C411	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C412	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C413	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C414	1-124-584-00	ELECT	100uF	20%	10V
C416	1-124-257-00	ELECT	2.2uF	20%	50V
C417	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C418	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C419	1-124-589-11	ELECT	47uF	20%	16V
C420	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C421	1-162-306-11	CERAMIC	0.01uF	20%	16V
C422	1-126-160-11	ELECT	1uF	20%	50V
C423	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C424	1-124-589-11	ELECT	47uF	20%	16V
C425	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C427	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C441	1-163-031-11	CERAMIC CHIP	0.01uF		50V
			(X825MI/MN/MNB, X835ME/MN)		
C442	1-163-031-11	CERAMIC CHIP	0.01uF		50V
			(X825MI/MN/MNB, X835ME/MN)		
C443	1-126-967-11	ELECT	47uF	20%	16V
			(X825MI/MN/MNB, X835ME/MN)		
C461	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C462	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C463	1-163-031-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remark
C464	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C465	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C466	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C501	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C502	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C503	1-124-589-11	ELECT	47uF	20%	16V
C510	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C520	1-126-162-11	ELECT	3.3uF	20%	50V
C521	1-126-096-11	ELECT	10uF	20%	35V
C522	1-137-372-11	FILM	0.022uF	5%	50V
C523	1-126-163-11	ELECT	4.7uF	20%	50V
C524	1-124-589-11	ELECT	47uF	20%	16V
C525	1-137-370-11	FILM	0.01uF	5%	50V
C530	1-126-162-11	ELECT	3.3uF	20%	50V
C531	1-126-096-11	ELECT	10uF	20%	35V
C532	1-137-372-11	FILM	0.022uF	5%	50V
C533	1-126-963-11	ELECT	4.7uF	20%	50V
C534	1-124-589-11	ELECT	47uF	20%	16V
C535	1-137-370-11	FILM	0.01uF	5%	50V
C541	1-137-372-11	FILM	0.022uF	5%	50V
C542	1-126-235-11	ELECT	100uF	20%	10V
C551	1-124-234-00	ELECT	22uF	20%	16V
C552	1-124-234-00	ELECT	22uF	20%	16V
C561	1-126-160-11	ELECT	1uF	20%	50V
C562	1-137-370-11	FILM	0.01uF	5%	50V
C563	1-126-163-11	ELECT	4.7uF	20%	50V
C565	1-163-143-00	CERAMIC CHIP	0.0012uF	5%	50V
					(X825AS)
C565	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
			(X825MI/MN/MNB, X835)		
C566	1-163-014-00	CERAMIC CHIP	0.0027uF	5%	50V
					(X825AS)
C566	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
			(X825MI/MN/MNB, X835)		
C571	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C572	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C591	1-124-584-00	ELECT	100uF	20%	10V
C592	1-126-235-11	ELECT	100uF	20%	10V
C593	1-124-589-11	ELECT	47uF	20%	16V
C681	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C682	1-126-967-11	ELECT	47uF	20%	16V
C683	1-126-935-11	ELECT	470uF	20%	6.3V
C684	1-126-967-11	ELECT	47uF	20%	16V
C701	1-126-967-11	ELECT	47uF	20%	16V
C702	1-126-964-11	ELECT	10uF	20%	50V
C703	1-126-964-11	ELECT	10uF	20%	50V
C704	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C705	1-126-964-11	ELECT	10uF	20%	50V

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Ref. No.	Part No.	Description			Remark
C706	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C707	1-126-967-11	ELECT	47uF	20%	16V
C708	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C711	1-126-935-11	ELECT	470uF	20%	16V
C712	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C713	1-126-967-11	ELECT	47uF	20%	16V
C714	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C716	1-126-964-11	ELECT	10uF	20%	50V
C717	1-126-964-11	ELECT	10uF	20%	50V
C718	1-128-551-11	ELECT	22uF	20%	25V
C721	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C727	1-126-933-11	ELECT	100uF	20%	10V
C728	1-126-933-11	ELECT	100UF	20%	10V
C729	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C873	1-124-257-00	ELECT	2.2uF	20%	50V
C881	1-104-696-11	FILM	0.015uF	5%	100V (X825)
C881	1-137-612-11	FILM	0.0068uF	5%	100V (X835)
C882	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C883	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C884	1-126-933-11	ELECT	100uF	20%	16V
C885	1-137-431-11	FILM	560PF	5%	50V
C891	1-104-697-11	FILM	0.047uF	5%	100V (X835)
C892	1-164-232-11	CERAMIC CHIP	0.01uF		50V (X835)
C893	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V (X835)
C894	1-124-455-00	ELECT	100uF	20%	16V (X835)
C901	1-163-031-11	CERAMIC CHIP	0.01uF		50V

< JACK >

Ref. No.	Part No.	Description
CJ621	1-764-222-11	JACK, PIN 6P(LINE-1 IN/LINE OUT)

< CONNECTOR >

Ref. No.	Part No.	Description
CN101	1-506-468-11	PIN, CONNECTOR 3P
* CN271	1-766-538-11	CONNECTOR, BOARD TO BOARD 8P
* CN275	1-766-717-11	CONNECTOR, BOARD TO BOARD 5P
* CN281	1-766-537-11	CONNECTOR (HMD) 5P
* CN291	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P
CN301	1-766-718-11	CONNECTOR, BOARD TO BOARD 17P
* CN501	1-766-600-11	CONNECTOR, BOARD TO BOARD 7P
* CN851	1-560-892-00	PIN, CONNECTOR 4P
* CN881	1-560-891-00	PIN, CONNECTOR 3P
CN901	1-774-461-11	CONNECTOR, FFC/FPC 15P
CN902	1-774-461-11	CONNECTOR, FFC/FPC 15P
CN903	1-774-461-11	CONNECTOR, FFC/FPC 15P
CN904	1-766-980-71	CONNECTOR, FFC/FPC 7P
CN905	1-506-470-11	PIN, CONNECTOR 5P
CN906	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P
CN907	1-506-469-11	PIN, CONNECTOR 4P

< DIODE >

Ref. No.	Part No.	Description		Remark
D151	8-719-200-82	DIODE	11ES2	
D152	8-719-200-82	DIODE	11ES2	
D201	8-719-200-82	DIODE	11ES2	
D202	8-719-801-48	DIODE	1SS193	
D251	8-719-801-48	DIODE	1SS193	
D261	8-719-048-26	DIODE	GL528V1	
D265	8-719-109-93	DIODE	RD6.2ES-B2	
D267	8-719-109-93	DIODE	RD6.2ES-B2	
D291	8-719-977-24	DIODE	DTZ9.1B	
D301	8-719-911-19	DIODE	1SS119-25	
D401	8-719-801-78	DIODE	1SS184	(X825MI/MN/MNB, X835ME/MN)
D402	8-719-801-48	DIODE	1SS193	
D403	8-719-801-48	DIODE	1SS193	
D591	8-719-404-46	DIODE	MA110	
D610	8-719-109-74	DIODE	RD4.3ES-B1	
⚠D702	8-719-800-76	DIODE	1SS226	
D703	8-719-110-78	DIODE	RD33ES-B2	
D708	8-719-911-19	DIODE	1SS119	
D709	8-719-109-85	DIODE	RD5.1ES-B2	
D710	8-719-911-19	DIODE	1SS119	
D902	8-719-200-82	DIODE	11ES2	

< IC >

Ref. No.	Part No.	Description		Remark
IC101	8-759-246-14	IC	TA8823N	
IC151	8-752-868-40	IC	CXP82948-001Q	
IC152	8-759-248-87	IC	MM1256XF-BE	
IC153	8-759-278-56	IC	AK6440HF-E2	
IC201	8-752-852-06	IC	CXP87248A-016Q	
IC251	8-759-335-76	IC	uPC5023GR-089-E2	
IC291	8-759-294-26	IC	BA6209-V2	
IC301	1-801-153-11	IC	YC MODULE, 3(PAL)	(X825AS, 835AS)
IC301	1-801-168-11	IC	YC MODULE, 3(MULTI)	(X825MI/MN/MNB, X835ME/MN)
IC401	8-759-363-40	IC	MB90089PF-G-163-BND-ER	
IC402	8-759-164-09	IC	LA7218M	
IC441	1-810-636-11	IC	LA7356M-TLM	(X825MI/MN/MNB, X835ME/MN)
IC461	8-759-295-66	IC	BA7653AF-E2	
IC501	8-759-365-32	IC	XLH7779K-VP	
IC551	8-759-089-84	IC	BA7755AF	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
		< JUMPER RESISTOR >	
JP1	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP14	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP17	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP31	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP43	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP45	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP49	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP53	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP54	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP56	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP77	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP78	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP81	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP82	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP83	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP90	1-216-296-00	METAL CHIP 0 5% 1/8W	
		< JUMPER RESISTOR >	
JR101	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR252	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR253	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR302	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR303	1-216-295-00	METAL CHIP 0 5% 1/10W	(X825AS)
JR307	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR308	1-216-295-00	METAL CHIP 0 5% 1/10W	(X825MI/MN/MNB, X835)
JR310	1-216-295-00	METAL CHIP 0 5% 1/10W	(X825AS)
JR311	1-216-295-00	METAL CHIP 0 5% 1/10W	(X825MI/MN/MNB, X835)
JR404	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR576	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR701	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR704	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR705	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR885	1-216-295-00	METAL CHIP 0 5% 1/10W	(X825)
JR895	1-216-295-00	METAL CHIP 0 5% 1/10W	(X835)
JR901	1-216-295-00	METAL CHIP 0 5% 1/10W	(X825AS)
JR902	1-216-295-00	METAL CHIP 0 5% 1/10W	(X825MI/MN/MNB, X835)
JR903	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR904	1-216-296-00	METAL CHIP 0 5% 1/8W	
		< COIL >	
L101	1-408-421-00	INDUCTOR 100uH	
L151	1-408-970-21	INDUCTOR 10uH	
L201	1-408-970-21	INDUCTOR 10uH	

Ref. No.	Part No.	Description	Remark
L302	1-414-186-31	INDUCTOR 33uH	
L303	1-414-186-31	INDUCTOR 33uH	
L304	1-408-416-00	INDUCTOR 39uH	
L305	1-414-186-31	INDUCTOR 33uH	
L306	1-410-514-11	INDUCTOR 27uH	(X825MI/MN/MNB, X835)
L351	1-410-524-41	INDUCTOR 180uH	
L352	1-414-189-31	INDUCTOR 100uH	
L353	1-410-513-11	INDUCTOR 22uH	
L401	1-408-421-00	INDUCTOR 100uH	
L402	1-410-515-11	INDUCTOR 33uH	(X825MI/MN/MNB, X835ME/MN)
L403	1-412-470-21	INDUCTOR 22uH	
L404	1-408-421-00	INDUCTOR 100uH	
L444	1-414-189-31	INDUCTOR 100uH	(X825MI/MN/MNB, X835ME/MN)
L461	1-414-189-31	INDUCTOR 100uH	
L681	1-410-482-31	INDUCTOR 100uH	
L701	1-414-183-41	INDUCTOR 10uH	
L702	1-414-189-31	INDUCTOR 100uH	
L703	1-414-183-41	INDUCTOR 10uH	
L704	1-410-501-11	INDUCTOR 2.2uH	
L705	1-414-187-11	INDUCTOR 47uH	
L706	1-410-501-11	INDUCTOR 2.2uH	
L881	1-410-687-11	INDUCTOR 1.2mH	
L891	1-410-687-11	INDUCTOR 1.2mH	(X835)
		< PIN CABLE >	
P701	1-555-110-00	CABLE, PIN	
		< PHOTO INTERRUPTER >	
PH261	8-749-010-19	PHOTO INTERRUPTER GP3S113	
PH262	8-749-010-20	PHOTO INTERRUPTER GP3S114	
		< IC LINK >	
⚠PS271	1-532-727-11	LINK, IC ICP-N5 (0.25A)	
⚠PS885	1-532-727-11	LINK, IC ICP-N5 (0.25A)	
		< THERMISTOR >	
⚠PTH592	1-202-855-00	THERMISTOR, POSITIVE	
		< TRANSISTOR >	
Q201	8-729-010-25	TRANSISTOR MSD601-RT1	
Q202	8-729-901-06	TRANSISTOR DTA144EK	
Q261	8-729-025-92	PHOTO TRANSISTOR PT380F	
Q262	8-729-025-92	PHOTO TRANSISTOR PT380F	
Q263	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q301	8-729-421-19	TRANSISTOR UN2213	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

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Ref. No.	Part No.	Description	Remark
Q303	8-729-010-29	TRANSISTOR MDS601-RST-1	
Q305	8-729-901-06	TRANSISTOR DTA144EK	
Q332	8-729-421-19	TRANSISTOR UN2213	(X825MI/MN/MNB,X835)
Q333	8-729-421-19	TRANSISTOR UN2213	(X825MI/MN/MNB,X835)
Q351	8-729-421-19	TRANSISTOR UN2213	(X825MI/MN/MNB,X835)
Q352	8-729-010-29	TRANSISTOR MSD601-RST1	
Q353	8-729-010-29	TRANSISTOR MSD601-RST1	
Q401	8-729-421-19	TRANSISTOR UN2213	(X825MI/MN/MNB,X835ME/MN)
Q402	8-729-901-06	TRANSISTOR DTA144EK	
Q404	8-729-010-05	TRANSISTOR MSB709-RT1	
Q405	8-729-010-25	TRANSISTOR MSD601-RT1	(X825MI/MN/MNB,X835ME/MN)
Q406	8-729-010-05	TRANSISTOR MSB709-RT1	
Q407	8-729-010-05	TRANSISTOR MSB709-RT1	
Q413	8-729-010-25	TRANSISTOR MSD601-RT1	
Q591	8-729-804-41	TRANSISTOR 2SB1122-S	
Q592	8-729-820-68	TRANSISTOR 2SD1802FA-S	
Q681	8-729-010-05	TRANSISTOR MSB709-RT1	
Q701	8-729-421-19	TRANSISTOR UN2213	
⚠Q703	8-729-173-38	TRANSISTOR 2SA733-K	
Q704	8-729-106-68	TRANSISTOR 2SD1615A-GP	
Q710	8-729-010-05	TRANSISTOR MSB709-RT1	
Q711	8-729-424-67	TRANSISTOR UN2216	
Q712	8-729-424-67	TRANSISTOR UN2216	
Q713	8-729-424-67	TRANSISTOR UN2216	
Q714	8-729-901-06	TRANSISTOR DTA144EK	
Q881	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q	
Q882	8-729-900-51	TRANSISTOR DTA114TK	
Q886	8-729-010-29	TRANSISTOR MSD601-RST1	
Q891	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q	(X835)
Q892	8-729-900-51	TRANSISTOR DTA114TK	(X835)

< RESISTOR >

Ref. No.	Part No.	Description				Remark
R101	1-216-119-00	METAL CHIP	820K	5%	1/10W	
R102	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R103	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R104	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R105	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R106	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R107	1-216-186-00	METAL GLAZE	330	5%	1/8W	
R108	1-216-121-91	METAL GLAZE	1M	5%	1/10W	
R111	1-216-097-91	METAL GLAZE	100K	5%	1/10W	
R151	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R151	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X835)
R152	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R153	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R154	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R157	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R158	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R159	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R160	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R161	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R162	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R163	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R164	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R165	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R166	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R167	1-216-222-00	METAL GLAZE	10K	5%	1/8W	
R168	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X825)
R168	1-216-095-00	METAL CHIP	82K	5%	1/10W	(X835)
R169	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R201	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R203	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R204	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R205	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R206	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R207	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R208	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R209	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R210	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R211	1-216-107-00	METAL CHIP	270K	5%	1/10W	
R212	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R213	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R214	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R215	1-216-095-00	METAL CHIP	82K	5%	1/10W	
R218	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R219	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R233	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R234	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R251	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R252	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R253	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R254	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R255	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R256	1-216-103-91	METAL GLAZE	180K	5%	1/10W	
R261	1-249-400-11	CARBON	39	5%	1/4W	
R262	1-249-400-11	CARBON	39	5%	1/4W	
R263	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R264	1-216-107-00	METAL CHIP	270K	5%	1/10W	
R265	1-216-107-00	METAL CHIP	270K	5%	1/10W	
R266	1-249-413-11	CARBON	470	5%	1/4W	
R267	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R268	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R271	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R274	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R275	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R276	1-216-056-00	METAL GLAZE	2K	5%	1/10W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
R277	1-216-068-00	METAL CHIP	6.2K	5%	1/10W
R278	1-216-075-00	METAL CHIP	12K	5%	1/10W
R281	1-216-238-91	METAL GLAZE	47K	5%	1/8W
R282	1-216-238-91	METAL GLAZE	47K	5%	1/8W
R283	1-216-238-91	METAL GLAZE	47K	5%	1/8W
R284	1-216-238-91	METAL GLAZE	47K	5%	1/8W
R293	1-216-295-00	METAL CHIP	0	5%	1/10W
R301	1-216-037-00	METAL CHIP	330	5%	1/10W
R302	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R303	1-216-295-00	METAL CHIP	0	5%	1/10W
R304	1-208-798-11	METAL GLAZE	4.7K	0.50%	1/10W
R305	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R306	1-216-689-11	METAL CHIP	39K	5%	1/10W
R307	1-216-041-00	METAL CHIP	470	5%	1/10W
R309	1-216-057-00	METAL CHIP	2.2K	5%	1/10W (X825MI/MN/MNB, X835ME/MN)
R310	1-216-073-00	METAL CHIP	10K	5%	1/10W
R311	1-216-057-11	METAL CHIP	2.2K	5%	1/10W (X825MI/MN/MNB, X835ME/MN)
R312	1-216-057-11	METAL CHIP	10K	5%	1/10W
R313	1-216-295-00	METAL CHIP	0	5%	1/10W
R315	1-216-103-91	METAL GLAZE	180K	5%	1/10W
R332	1-216-052-00	METAL CHIP	1.3K	5%	1/10W (X825MI/MN/MNB, X835)
R333	1-208-799-11	METAL CHIP	5.1K	0.50%	1/10W (X825MI/MN/MNB, X835)
R334	1-216-295-00	METAL CHIP	0	5%	1/10W (X825MI/MN/MNB, X835)
R351	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R352	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R353	1-216-045-00	METAL CHIP	680	5%	1/10W
R354	1-216-081-00	METAL CHIP	22K	5%	1/10W
R355	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R356	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R357	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R358	1-216-041-00	METAL CHIP	470	5%	1/10W
R401	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R402	1-216-073-00	METAL GLAZE	10K	5%	1/10W (X825MI/MN/MNB, X835ME/MN)
R403	1-216-073-00	METAL GLAZE	10K	5%	1/10W (X825MI/MN/MNB, X835ME/MN)
R404	1-216-073-00	METAL CHIP	10K	5%	1/10W
R407	1-249-414-11	CARBON	560	5%	1/4W
R408	1-216-101-00	METAL CHIP	150K	5%	1/10W
R409	1-216-063-91	METAL GLAZE	3.9K	5%	1/10W
R410	1-216-043-91	METAL GLAZE	560	5%	1/10W
R411	1-216-025-91	METAL GLAZE	100	5%	1/10W
R412	1-216-295-00	METAL CHIP	0	5%	1/10W
R413	1-216-295-00	METAL CHIP	0	5%	1/10W
R414	1-216-081-00	METAL CHIP	22K	5%	1/10W
R415	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R416	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R417	1-216-033-00	METAL CHIP	220	5%	1/10W
R418	1-216-033-00	METAL CHIP	220	5%	1/10W
R421	1-216-230-00	METAL GLAZE	22K	5%	1/8W
R423	1-216-073-00	METAL CHIP	10K	5%	1/10W
R442	1-216-057-00	METAL CHIP	2.2K	5%	1/10W (X825MI/MN/MNB, X835ME/MN)
R443	1-216-070-00	METAL CHIP	7.5K	5%	1/10W (X825MI/MN/MNB, X835ME/MN)
R461	1-216-295-00	METAL CHIP	0	5%	1/10W
R462	1-216-295-00	METAL CHIP	0	5%	1/10W
R501	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R502	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R503	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R504	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R505	1-216-295-00	METAL CHIP	0	5%	1/10W
R506	1-216-295-00	METAL CHIP	0	5%	1/10W
R507	1-216-295-00	METAL CHIP	0	5%	1/10W
R510	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R514	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R515	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R521	1-216-073-00	METAL CHIP	10K	5%	1/10W
R522	1-216-050-00	METAL GLAZE	1.1K	5%	1/10W
R523	1-216-079-00	METAL CHIP	18K	5%	1/10W
R524	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R525	1-208-809-11	METAL GLAZE	13K	0.50%	1/10W
R526	1-216-103-91	METAL GLAZE	180K	0.50%	1/10W (X825AS)
R531	1-216-073-00	METAL CHIP	10K	5%	1/10W
R532	1-216-050-00	METAL GLAZE	1.1K	5%	1/10W
R533	1-216-079-00	METAL CHIP	18K	5%	1/10W
R534	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R535	1-208-806-11	METAL GLAZE	10K	0.50%	1/10W
R536	1-216-103-91	METAL GLAZE	180K	5%	1/10W (X825AS)
R541	1-216-081-00	METAL CHIP	22K	5%	1/10W
R551	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R561	1-216-069-00	METAL CHIP	6.8K	5%	1/10W (X825AS)
R561	1-216-067-00	METAL CHIP	5.6K	5%	1/10W (X825MI/MN/MNB, X835)
R562	1-216-109-00	METAL CHIP	330K	5%	1/10W
R563	1-216-069-00	METAL CHIP	6.8K	5%	1/10W (X825MI/MN/MNB, X835)

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Ref. No.	Part No.	Description	Remark
R563	1-216-077-00	METAL CHIP 10K 5% 1/10W	(X825MI/MN/MNB, X835)
R564	1-216-041-00	METAL CHIP 470 5% 1/10W	
R565	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R566	1-216-089-91	METAL GLAZE 47K 5% 1/10W	(X825AS)
R566	1-216-099-00	METAL GLAZE 120K 5% 1/10W	(X825MI/MN/MNB, X835)
R567	1-216-295-00	METAL CHIP 0 5% 1/10W	
R571	1-216-081-00	METAL CHIP 22K 5% 1/10W	(X825AS)
R571	1-216-077-00	METAL CHIP 15K 5% 1/10W	(X825MI/MN/MNB, X835)
R572	1-216-083-91	METAL GLAZE 27K 5% 1/10W	(X825AS)
R572	1-216-095-00	METAL CHIP 82K 5% 1/10W	(X825MI/MN/MNB, X835)
R573	1-216-214-00	METAL GLAZE 4.7K 5% 1/8W	
R575	1-216-295-00	METAL CHIP 0 5% 1/10W	
R591	1-249-421-11	CARBON 2.2K 5% 1/4W	
R592	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R601	1-216-022-00	METAL CHIP 75 5% 1/10W	
R611	1-216-041-00	METAL CHIP 470 5% 1/10W	
R612	1-216-041-00	METAL CHIP 470 5% 1/10W	
R681	1-216-037-00	METAL CHIP 330 5% 1/10W	
R683	1-249-407-11	CARBON 150 5% 1/4W	
R684	1-249-408-11	CARBON 180 5% 1/4W	
R685	1-216-021-00	METAL CHIP 68 5% 1/10W	
R701	1-216-041-00	METAL CHIP 470 5% 1/10W	
R702	1-216-041-00	METAL CHIP 470 5% 1/10W	
R703	1-249-404-00	CARBON 82 5% 1/4W	
R704	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R705	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R706	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R710	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R711	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R712	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R719	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R720	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R721	1-216-037-00	METAL CHIP 330 5% 1/10W	
R722	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R724	1-249-417-11	CARBON 1K 5% 1/4W	
R727	1-216-049-91	METAL GLAZE 1K 5% 1/10W	(X825MI/MN/MNB, X835ME/MN)
R731	1-216-025-91	METAL CHIP 100K 5% 1/10W	
R732	1-216-025-91	METAL CHIP 100K 5% 1/10W	
R738	1-216-025-91	METAL CHIP 100K 5% 1/10W	
R874	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R881	1-216-081-00	METAL CHIP 22K 5% 1/10W	
⚠R882	1-249-389-11	CARBON 4.7 5% 1/4W F	(X825)
⚠R882	1-249-395-11	CARBON 15 5% 1/4W F	(X835)
R885	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R886	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R887	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R891	1-216-083-00	METAL CHIP 27K 5% 1/10W	(X835)
⚠R892	1-249-394-11	CARBON 12 5% 1/4W F	(X835)
R901	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
		< RF MODULATOR >	
⚠RF701	1-467-958-21	MODULATOR, RF (RFU-2100)	
		< VARIABLE RESISTOR >	
RV521	1-241-763-11	RES, ADJ, CERMET 4.7K	
RV522	1-241-885-11	RES, ADJ, CERMET 470K	(X825MI/MN/MNB, X835)
RV531	1-241-763-11	RES, ADJ, CERMET 4.7K	
RV532	1-241-885-11	RES, ADJ, CERMET 470K	(X825MI/MN/MNB, X835)
RV541	1-241-764-11	RES, ADJ, CERMET 10K	
		< SWITCH >	
S251	1-570-953-11	SWITCH, PUSH (1 KEY) (REC PRF)	
S901	1-762-117-11	SWITCH, SLIDE (NTSC PB)	(X825AS)
S901	1-762-207-11	SWITCH, SLIDE (NTSC PB)	(X825MI/MN/MNB, X835)
		< TRANSFORMER >	
T881	1-423-414-11	TRANSFORMER, BIAS OSCILLATION	(X825)
T881	1-423-413-11	TRANSFORMER, BIAS OSCILLATION	(X835)
T891	1-423-415-11	TRANSFORMER, BIAS OSCILLATION	(X835)
		< TUNER >	
⚠TU701	1-693-267-21	TUNER, IF (BTF-3WC401)	(X825AS, X835AS)
⚠TU701	1-693-327-11	TUNER (BTF-3WC432)	(X825MI)
⚠TU701	1-693-270-21	TUNER, IF (BTF-3WC421)	(X825MN/MNB, X835ME/MN)
		< VIBRATOR >	
X151	1-579-463-11	VIBRATOR, CRYSTAL (32.768kHz)	
X201	1-760-494-11	VIBRATOR, CRYSTAL (16MHz)	
X401	1-577-289-11	VIBRATOR, CRYSTAL (14MHz)	
X402	1-577-165-11	VIBLATOR, CERAMIC (500kHz)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
*	A-6782-925-A	MA-252 BOARD, COMPLETE (X715ME)	
*	A-6782-924-A	MA-252 BOARD, COMPLETE (X715PS)	
*	A-6782-926-A	MA-252 BOARD, COMPLETE (X715SG)	
*	A-6782-920-A	MA-252 BOARD, COMPLETE (X815ME)	
*	A-6782-919-A	MA-252 BOARD, COMPLETE (X815PS)	
*	A-6782-921-A	MA-252 BOARD, COMPLETE (X815SG)	

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(Ref. No. 4,000 Series)

Ref. No.	Part No.	Description
*	3-960-273-01	SPACER, TOP END
*	3-960-274-01	SPACER, LED

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C101	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C102	1-126-967-11	ELECT	47uF	20%	16V
C103	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C104	1-124-244-00	ELECT	22uF	20%	16V
C105	1-124-584-00	ELECT	100uF	20%	10V
C106	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C107	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C108	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C109	1-124-257-00	ELECT	2.2uF	20%	50V
C111	1-124-257-00	ELECT	2.2uF	20%	50V
C114	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C160	1-125-507-11	CAPACITOR	0.22F		5.5V
C201	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C202	1-164-346-91	CERAMIC CHIP	1uF		16V
C203	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C204	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C205	1-163-081-00	CERAMIC CHIP	0.22uF		25V
C206	1-164-346-11	CERAMIC CHIP	1uF		16V
C207	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C208	1-124-584-00	ELECT	100uF	20%	10V
C209	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C210	1-124-589-11	ELECT	47uF	20%	16V
C211	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C214	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C215	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C216	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C252	1-162-638-11	CERAMIC CHIP	1uF		16V
C253	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C254	1-124-589-11	ELECT	47uF	20%	16V
C255	1-130-489-00	MYLAR	0.033uF	5%	50V
C256	1-137-441-11	FILM	0.027uF	5%	50V
C261	1-126-176-11	ELECT	220uF	20%	10V
C262	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C264	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C266	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C267	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C273	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C275	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C291	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C292	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C294	1-124-455-00	ELECT	100uF	20%	16V
C295	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C296	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C297	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C301	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C302	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C304	1-124-589-11	ELECT	47uF	20%	16V
C305	1-124-589-11	ELECT	47uF	20%	16V
C306	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C307	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C308	1-126-964-11	ELECT	10uF	20%	50V
C309	1-124-589-11	ELECT	47uF	20%	16V
C310	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C312	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C331	1-163-124-00	CERAMIC CHIP	200PF	5%	50V
C351	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C352	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C353	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C354	1-124-589-11	ELECT	47uF	20%	16V
C356	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C357	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C358	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C359	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C360	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C401	1-124-589-11	ELECT	47uF	20%	16V
C402	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C409	1-124-589-11	ELECT	47uF	20%	16V
C410	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C415	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C416	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C417	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C418	1-126-160-11	ELECT	1uF	20%	50V
C420	1-130-481-00	MYLAR	0.0068uF	5%	50V
C421	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V
C422	1-130-487-00	MYLAR	0.022uF	5%	50V
C423	1-124-465-00	ELECT	0.47uF	20%	50V
C424	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C427	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C431	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C432	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C441	1-163-031-11	CERAMIC CHIP	0.01uF	5%	50V
C442	1-163-234-11	CERAMIC CHIP	0.01uF	5%	50V
C443	1-126-967-11	ELECT	47uF	20%	16V
C461	1-163-031-11	CERAMIC CHIP	0.01uF		50V

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Ref. No.	Part No.	Description			Remark
C462	1-163-038-91	CERAMIC CHIP	0. 1uF		25V
C463	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C464	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C465	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C466	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C501	1-163-011-11	CERAMIC CHIP	0. 0015uF	10%	50V (X815)
C502	1-163-011-11	CERAMIC CHIP	0. 0015uF	10%	50V (X815)
C503	1-124-589-11	ELECT	47uF	20%	16V (X815)
C510	1-104-760-11	CERAMIC CHIP	0. 047uF	10%	50V (X815)
C520	1-126-162-11	ELECT	3. 3uF	20%	50V (X815)
C521	1-126-096-11	ELECT	10uF	20%	35V (X815)
C522	1-137-372-11	FILM	0. 022uF	5%	50V (X815)
C523	1-126-163-11	ELECT	4. 7uF	20%	50V (X815)
C524	1-124-589-11	ELECT	47uF	20%	16V (X815)
C525	1-137-370-11	FILM	0. 01uF	5%	50V (X815)
C530	1-126-162-11	ELECT	3. 3uF	20%	50V (X815)
C531	1-126-096-11	ELECT	10uF	20%	35V (X815)
C532	1-137-372-11	FILM	0. 022uF	5%	50V (X815)
C533	1-126-963-11	ELECT	4. 7uF	20%	50V (X815)
C534	1-124-589-11	ELECT	47uF	20%	16V (X815)
C535	1-137-370-11	FILM	0. 01uF	5%	50V (X815)
C541	1-137-372-11	FILM	0. 022uF	5%	50V (X815)
C542	1-126-235-11	ELECT	100uF	20%	10V (X815)
C551	1-124-234-00	ELECT	22uF	20%	16V (X815)
C552	1-124-234-00	ELECT	22uF	20%	16V (X815)
C561	1-126-160-11	ELECT	1uF	20%	50V
C562	1-137-370-11	FILM	0. 01uF	5%	50V
C563	1-126-163-11	ELECT	4. 7uF	20%	50V
C565	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C566	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C571	1-163-141-00	CERAMIC CHIP	0. 001uF	5%	50V (X815)
C572	1-163-141-00	CERAMIC CHIP	0. 001uF	5%	50V (X815)
C591	1-124-584-00	ELECT	100uF	20%	10V (X815)
C592	1-126-235-11	ELECT	100uF	20%	10V (X815)
C593	1-124-589-11	ELECT	47uF	20%	16V (X815)
C681	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C682	1-126-967-11	ELECT	47uF	20%	16V
C683	1-126-935-11	ELECT	470uF	20%	6. 3V
C684	1-126-967-11	ELECT	47uF	20%	16V
C701	1-126-967-11	ELECT	47uF	20%	16V
C702	1-126-964-11	ELECT	10uF	20%	50V
C703	1-126-964-11	ELECT	10uF	20%	50V (X815)
C704	1-163-009-11	CERAMIC CHIP	0. 001uF	10%	50V
C705	1-126-964-11	ELECT	10uF	20%	50V
C706	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C707	1-126-967-11	ELECT	47uF	20%	16V
C708	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C711	1-126-935-11	ELECT	470uF	20%	16V
C712	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C713	1-126-967-11	ELECT	47uF	20%	16V
C714	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C716	1-126-964-11	ELECT	10uF	20%	50V (X815)
C717	1-126-964-11	ELECT	10uF	20%	50V
C721	1-164-004-11	CERAMIC CHIP	0. 1uF	10%	25V
C727	1-126-933-11	ELECT	100uF	20%	10V
C851	1-126-157-11	ELECT	10uF	20%	16V (X715)
C852	1-124-234-00	ELECT	22uF	20%	16V (X715)
C853	1-124-234-00	ELECT	22uF	20%	16V (X715)
C854	1-124-252-00	ELECT	0. 33uF	20%	50V (X715)
C855	1-126-157-11	ELECT	10uF	20%	16V (X715)
C856	1-126-160-11	ELECT	1uF	20%	50V (X715)
C857	1-126-160-11	ELECT	1uF	20%	50V (X715)

Ref. No.	Part No.	Description			Remark
C858	1-126-160-11	ELECT	1uF	20%	50V (X715)
C864	1-126-162-11	ELECT	3. 3uF	20%	50V (X715)
C871	1-163-141-00	CERAMIC CHIP	0. 001uF	5%	50V (X715)
C872	1-163-141-00	CERAMIC CHIP	0. 001uF	5%	50V (X715)
C873	1-124-257-00	ELECT	2. 2uF	20%	50V
C881	1-137-612-11	FILM	0. 0068uF	5%	100V (X715)
C881	1-104-696-11	FILM	0. 015uF	5%	100V (X815)
C882	1-164-232-11	CERAMIC CHIP	0. 01uF		50V
C883	1-163-011-11	CERAMIC CHIP	0. 0015uF	10%	50V
C884	1-126-933-11	ELECT	100uF	20%	16V
C885	1-137-431-11	FILM	560PF	5%	50V
C891	1-104-697-11	FILM	0. 047uF	5%	100V (X715)
C892	1-164-232-11	CERAMIC CHIP	0. 01uF		50V (X715)
C893	1-163-011-11	CERAMIC CHIP	0. 0015uF	10%	50V (X715)
C894	1-124-455-00	ELECT	100uF	20%	16V (X715)
C901	1-163-031-11	CERAMIC CHIP	0. 01uF		50V

< JACK >

Ref. No.	Part No.	Description	Remark
CJ621	1-568-185-21	JACK, PIN 4P (LINE-1 IN/LINE OUT)	(X715)
CJ621	1-764-222-11	JACK, PIN 6P (LINE-1 IN/LINE OUT)	(X815)

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN101	1-506-468-11	PIN, CONNECTOR 3P	
* CN271	1-766-538-11	CONNECTOR, BOARD TO BOARD 8P	
* CN275	1-766-717-11	CONNECTOR, BOARD TO BOARD 5P	
* CN281	1-766-537-11	CONNECTOR (HMD) 5P	
* CN291	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P	
CN301	1-766-718-11	CONNECTOR, BOARD TO BOARD 17P	
* CN501	1-766-600-11	CONNECTOR, BOARD TO BOARD 7P	
* CN851	1-560-892-00	PIN, CONNECTOR 4P	
* CN881	1-560-891-00	PIN, CONNECTOR 3P	
CN903	1-774-461-11	CONNECTOR, FFC/FPC 15P	
CN905	1-506-469-11	PIN, CONNECTOR 4P	(X715)
CN905	1-506-470-11	PIN, CONNECTOR 5P	(X815)
CN906	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P	
CN908	1-506-473-11	PIN, CONNECTOR 8P	

< TRIMMER >

Ref. No.	Part No.	Description	Remark
CT401	1-141-334-11	CAP, VAR, TRIMMER 30P	

< DIODE >

Ref. No.	Part No.	Description		Remark
D201	8-719-200-82	DIODE	11ES2	
D202	8-719-801-48	DIODE	1SS193	
D203	8-719-801-78	DIODE	1SS184	(X715)
D204	8-719-200-82	DIODE	11ES2	
D251	8-719-801-48	DIODE	1SS193	
D261	8-719-048-26	LED	GL528V1	
D265	8-719-109-93	DIODE	RD6. 2ES-B2	
D267	8-719-109-93	DIODE	RD6. 2ES-B2	
D291	8-719-977-24	DIODE	DTZ9. 1B	
D301	8-719-911-19	DIODE	1SS119	
D403	8-719-801-48	DIODE	1SS193	
D591	8-719-404-46	DIODE	MA110	(X815)
D610	8-719-109-74	DIODE	RD4. 3ES-B1	
D701	8-719-200-82	DIODE	11ES2	
⚠D702	8-719-800-76	DIODE	1SS226	
D703	8-719-110-78	DIODE	RD33ES-B2	
D708	8-719-911-19	DIODE	1SS119-25	
D853	8-719-911-19	DIODE	1SS119-25	(X715)
D902	8-719-200-82	DIODE	11ES2	
D903	8-719-801-48	DIODE	1SS193	
D904	8-719-801-48	DIODE	1SS193	

< IC >

Ref. No.	Part No.	Description		Remark
IC101	8-759-246-14	IC	TA8823N	
IC201	8-752-867-58	IC	CXP87360-030Q	
IC202	8-759-248-87	IC	MM1256XF-BE	
IC203	8-759-278-56	IC	AK6440HF-E2	
IC251	8-759-335-76	IC	uPC5023GR-089-E2	
IC291	8-759-294-26	IC	BA6209-V2	
IC301	1-801-168-11	IC	YC MODULE 3 (MULTI)	
IC401	8-759-363-38	IC	LC74761M-9149-TLM	
IC441	1-810-636-11	IC	LA7356M-TLM	
IC461	8-759-295-66	IC	BA7653AF-E2	
IC501	8-759-365-32	IC	XLH7779K-VP	(X815)
IC551	8-759-089-84	IC	BA7755AF	(X815)
IC851	8-759-268-02	IC	BA7796FS-E2	(X715)

< JUMPER RESISTOR >

Ref. No.	Part No.	Description				Remark
JP21	1-216-295-00	METAL CHIP	0	5%	1/10W	(X715)
JP22	1-216-295-00	METAL CHIP	0	5%	1/10W	(X715)
JP95	1-216-295-00	METAL CHIP	0	5%	1/10W	(X715)
JP96	1-216-295-00	METAL CHIP	0	5%	1/10W	(X715)
JP001	1-216-295-00	METAL CHIP	0	5%	1/10W	
JP014	1-216-296-00	METAL CHIP	0	5%	1/8W	
JP017	1-216-296-00	METAL CHIP	0	5%	1/8W	
JP021	1-216-296-00	METAL CHIP	0	5%	1/8W	(X815)
JP022	1-216-295-00	METAL CHIP	0	5%	1/10W	(X815)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

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Ref. No.	Part No.	Description				Remark
JP031	1-216-296-00	METAL CHIP	0	5%	1/8W	
JP045	1-216-296-00	METAL CHIP	0	5%	1/8W	
JP057	1-216-296-00	METAL CHIP	0	5%	1/8W	

< JUMPER RESISTOR >

Ref. No.	Part No.	Description				Remark
JR101	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR202	1-216-295-00	METAL CHIP	0	5%	1/10W	(X715)
JR218	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR222	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR223	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR252	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR253	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR302	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR307	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR308	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR311	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR402	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR403	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR404	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR576	1-216-295-00	METAL CHIP	0	5%	1/10W	(X815)
JR701	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR708	1-216-295-00	METAL CHIP	0	5%	1/10W	(X815)
JR731	1-216-295-00	METAL CHIP	0	5%	1/10W	(X815)
JR732	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR735	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR740	1-216-295-00	METAL CHIP	0	5%	1/10W	
JR851	1-216-295-00	METAL CHIP	0	5%	1/10W	(X715)
JR852	1-216-295-00	METAL CHIP	0	5%	1/10W	(X715)
JR854	1-216-295-00	METAL CHIP	0	5%	1/10W	(X715)
JR856	1-216-295-00	METAL CHIP	0	5%	1/10W	(X715)
JR859	1-216-295-00	METAL CHIP	0	5%	1/10W	(X715)
JR885	1-216-295-00	METAL CHIP	0	5%	1/10W	(X815)
JR895	1-216-295-00	METAL CHIP	0	5%	1/10W	(X715)
JR903	1-216-296-00	METAL CHIP	0	5%	1/8W	
JR904	1-216-296-00	METAL CHIP	0	5%	1/8W	

< COIL >

Ref. No.	Part No.	Description		Remark
L101	1-408-421-00	INDUCTOR	100uH	
L201	1-408-970-21	INDUCTOR	10uH	
L302	1-414-186-31	INDUCTOR	33uH	
L303	1-414-186-31	INDUCTOR	33uH	
L304	1-408-416-00	INDUCTOR	39uH	
L305	1-414-186-31	INDUCTOR	33uH	
L306	1-410-514-11	INDUCTOR	27uH	
L351	1-410-524-41	INDUCTOR	180uH	
L352	1-414-189-31	INDUCTOR	100uH	
L353	1-410-513-11	INDUCTOR	22uH	
L401	1-408-421-00	INDUCTOR	100uH	
L402	1-408-421-00	INDUCTOR	100uH	
L403	1-410-513-11	INDUCTOR	22uH	
L404	1-410-506-11	INDUCTOR	5.6uH	
L444	1-414-189-31	INDUCTOR	100uH	
L461	1-414-189-31	INDUCTOR	100uH	
L681	1-410-482-31	INDUCTOR	100uH	
L702	1-414-189-31	INDUCTOR	100uH	
L703	1-414-183-41	INDUCTOR	10uH	
L704	1-410-501-11	INDUCTOR	2.2uH	
L705	1-414-187-11	INDUCTOR	47uH	
L707	1-410-501-11	INDUCTOR	2.2uH	
L851	1-410-482-31	INDUCTOR	100uH	(X715)
L881	1-410-687-11	INDUCTOR	1.2mH	
L891	1-410-687-11	INDUCTOR	1.2mH	(X715)

< PHOTO INTERRUPTER >

Ref. No.	Part No.	Description	Remark
PH261	8-749-010-19	PHOTO INTERRUPTER GP3S113	
PH262	8-749-010-20	PHOTO INTERRUPTER GP3S114	

< IC LINK >

Ref. No.	Part No.	Description	Remark
⚠PS271	1-532-727-11	LINK, IC ICP-N5 (0.25A)	
⚠PS885	1-532-727-11	LINK, IC ICP-N5 (0.25A)	

< THERMISTOR >

Ref. No.	Part No.	Description	Remark
⚠PTH592	1-202-855-00	THERMISTOR, POSITIVE	(X815)

< TRANSISTOR >

Ref. No.	Part No.	Description		Remark
Q201	8-729-010-25	TRANSISTOR	MSD601-RT1	
Q202	8-729-901-06	TRANSISTOR	DTA144EK	
Q261	8-729-025-92	PHOTO TRANSISTOR	PT380F	
Q262	8-729-025-92	PHOTO TRANSISTOR	PT380F	
Q263	8-729-281-53	TRANSISTOR	2SC1815-GR	
Q301	8-729-421-19	TRANSISTOR	UN2213	
Q303	8-729-010-29	TRANSISTOR	MSD601-RST1	
Q305	8-729-901-06	TRANSISTOR	DTA144EK	
Q332	8-729-421-19	TRANSISTOR	UN2213	
Q333	8-729-421-19	TRANSISTOR	UN2213	
Q351	8-729-421-19	TRANSISTOR	UN2213	
Q352	8-729-010-29	TRANSISTOR	MSD601-RST1	
Q353	8-729-010-29	TRANSISTOR	MSD601-RST1	
Q404	8-729-010-05	TRANSISTOR	MSB709-RT1	
Q405	8-729-010-05	TRANSISTOR	MSB709-RT1	
Q406	8-729-010-05	TRANSISTOR	MSB709-RT1	
Q522	8-729-421-19	TRANSISTOR	UN2213	(X815)
Q532	8-729-421-19	TRANSISTOR	UN2213	(X815)
Q591	8-729-804-41	TRANSISTOR	2SB1122-S	(X815)
Q592	8-729-820-68	TRANSISTOR	2SD1802FA-S	(X815)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
Q681	8-729-010-05	TRANSISTOR MSB709-RT1	
⚠Q703	8-729-173-38	TRANSISTOR 2SA733-K	
Q710	8-729-010-05	TRANSISTOR MSB709-RT1	
Q711	8-729-424-67	TRANSISTOR UN2216	
Q712	8-729-424-67	TRANSISTOR UN2216	(X815)
Q713	8-729-424-67	TRANSISTOR UN2216	(X815)
Q714	8-729-010-05	TRANSISTOR MSB709-RT1	
Q853	8-729-424-67	TRANSISTOR UN2216	
Q881	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q	
Q882	8-729-900-51	TRANSISTOR DTA114TK	
Q886	8-729-010-29	TRANSISTOR MSD601-RST1	
Q891	8-729-012-31	TRANSISTOR 2SC4040-TL2-0	(X715)
Q892	8-729-900-51	TRANSISTOR DTA114TK	(X715)
		< RESISTOR >	
R101	1-216-119-00	METAL CHIP 820K 5% 1/10W	
R102	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R103	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R104	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R105	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R106	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R107	1-216-186-00	METAL GLAZE 330 5% 1/8W	
R108	1-216-121-91	METAL GLAZE 1M 5% 1/10W	
R111	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R201	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R202	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	(X715ME)
R202	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	(X715PS)
R202	1-216-295-00	METAL CHIP 0 5% 1/10W	(X715SG)
R202	1-216-075-00	METAL CHIP 12K 5% 1/10W	(X815ME)
R202	1-216-081-00	METAL CHIP 22K 5% 1/10W	(X815PS)
R202	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	(X815SG)
R203	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R204	1-216-073-00	METAL CHIP 10K 5% 1/10W	(X715ME/PS, X815)
R206	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R207	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R208	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R209	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R210	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R211	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R212	1-216-095-00	METAL GLAZE 82K 5% 1/10W	
R213	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R214	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R215	1-216-095-00	METAL CHIP 82K 5% 1/10W	
R216	1-216-083-00	METAL CHIP 27K 5% 1/10W	(X715)
R217	1-216-085-00	METAL CHIP 33K 5% 1/10W	(X715)
R218	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R219	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R220	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R221	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R222	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R223	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R224	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R225	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R226	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R227	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R228	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R229	1-216-109-00	METAL CHIP 330K 5% 1/10W	
R230	1-216-105-91	METAL GLAZE 220K 5% 1/10W	
R233	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R234	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R251	1-216-049-91	METAL GLAZE 1K 5% 1/10W	
R252	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R253	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	
R254	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R255	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R256	1-216-103-91	METAL GLAZE 180K 5% 1/10W	
R261	1-249-400-11	CARBON 39 5% 1/4W	
R262	1-249-400-11	CARBON 39 5% 1/4W	
R263	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R264	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R265	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R266	1-249-413-11	CARBON 470 5% 1/4W	
R267	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R268	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R271	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R274	1-216-083-00	METAL CHIP 27K 5% 1/10W	
R275	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R276	1-216-056-00	METAL GLAZE 2K 5% 1/10W	
R277	1-216-068-00	METAL CHIP 6.2K 5% 1/10W	
R278	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R281	1-216-238-91	METAL GLAZE 47K 5% 1/8W	
R282	1-216-238-91	METAL GLAZE 47K 5% 1/8W	
R283	1-216-238-91	METAL GLAZE 47K 5% 1/8W	
R284	1-216-238-91	METAL GLAZE 47K 5% 1/8W	
R293	1-216-295-00	METAL CHIP 0 5% 1/10W	
R301	1-216-037-00	METAL CHIP 330 5% 1/10W	
R302	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R303	1-216-295-00	METAL CHIP 0 5% 1/10W	
R304	1-208-798-11	METAL GLAZE 4.7K 0.50% 1/10W	
R305	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R306	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

MA-252

Ref. No.	Part No.	Description				Remark
R307	1-216-041-00	METAL CHIP	470	5%	1/10W	
R309	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R310	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R311	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R312	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R313	1-216-295-00	METAL CHIP	0	5%	1/10W	
R315	1-216-103-91	METAL GLAZE	180K	5%	1/10W	
R332	1-216-052-00	METAL CHIP	1.3K	5%	1/10W	
R333	1-208-799-11	METAL GLAZE	5.1K	0.50%	1/10W	
R334	1-216-295-00	METAL CHIP	0	5%	1/10W	
R351	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R352	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R353	1-216-045-00	METAL CHIP	680	5%	1/10W	
R354	1-216-083-00	METAL CHIP	22K	5%	1/10W	
R355	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R356	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R357	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R358	1-216-041-00	METAL CHIP	470	5%	1/10W	
R413	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R414	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R415	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R416	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R417	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R418	1-216-045-00	METAL CHIP	680	5%	1/10W	
R419	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R420	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R421	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R422	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R423	1-216-077-00	METAL CHIP	2.2K	5%	1/10W	
R425	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R431	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R432	1-216-121-91	METAL GLAZE	1M	5%	1/10W	
R442	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	(X715, X815PS/SG)
R443	1-216-070-00	METAL CHIP	7.5K	5%	1/10W	
R461	1-216-295-00	METAL CHIP	0	5%	1/10W	
R462	1-216-295-00	METAL CHIP	0	5%	1/10W	
R501	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(X815)
R502	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(X815)
R503	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(X815)
R504	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(X815)
R505	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X815)
R506	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X815)
R507	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X815)
R510	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	(X815)
R514	1-216-049-91	METAL GLAZE	1K	5%	1/10W	(X815)
R515	1-216-049-91	METAL GLAZE	1K	5%	1/10W	(X815)
R521	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X815)
R522	1-216-050-00	METAL GLAZE	1.1K	5%	1/10W	(X815)
R523	1-216-079-00	METAL CHIP	18K	5%	1/10W	(X815)
R524	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	(X815)
R525	1-208-809-11	METAL GLAZE	13K	0.50%	1/10W	(X815)
R531	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X815)
R532	1-216-050-00	METAL GLAZE	1.1K	5%	1/10W	(X815)
R533	1-216-079-00	METAL CHIP	18K	5%	1/10W	(X815)
R534	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	(X815)
R535	1-208-806-11	METAL GLAZE	10K	0.50%	1/10W	(X815)
R541	1-216-081-00	METAL CHIP	22K	5%	1/10W	(X815)
R551	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	(X815)
R561	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R562	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R563	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R564	1-216-041-00	METAL CHIP	470	5%	1/10W	
R565	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R566	1-216-099-91	METAL GLAZE	120K	5%	1/10W	
R567	1-216-295-00	METAL CHIP	0	5%	1/10W	(X815)
R571	1-216-077-00	METAL CHIP	15K	5%	1/10W	(X815)
R572	1-216-095-00	METAL GLAZE	82K	5%	1/10W	(X815)
R573	1-216-214-00	METAL GLAZE	4.7K	5%	1/8W	(X815)
R575	1-216-295-00	METAL CHIP	0	5%	1/10W	(X815)
R591	1-249-421-11	CARBON	2.2K	5%	1/4W	(X815)
R592	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	(X815)
R601	1-216-022-00	METAL CHIP	75	5%	1/10W	
R611	1-216-041-00	METAL CHIP	470	5%	1/10W	
R612	1-216-041-00	METAL CHIP	470	5%	1/10W	(X815)
R681	1-216-037-00	METAL CHIP	330	5%	1/10W	
R683	1-249-407-11	CARBON	150	5%	1/4W	
R684	1-249-408-11	CARBON	180	5%	1/4W	
R685	1-216-021-00	METAL CHIP	68	5%	1/10W	
R703	1-249-404-00	CARBON	82	5%	1/4W	
R704	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R705	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R709	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R710	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R711	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R712	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R719	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R720	1-216-049-91	METAL GLAZE	1K	5%	1/10W	
R721	1-216-037-00	METAL CHIP	330	5%	1/10W	
R722	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R738	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R755	1-216-121-91	METAL GLAZE	1M	5%	1/10W	(X715, X815)
R851	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	(X715)
R852	1-216-049-91	METAL GLAZE	1K	5%	1/10W	(X715)

Ref. No.	Part No.	Description	Remark
R853	1-216-041-00	METAL CHIP 470 5% 1/10W	(X715)
R854	1-216-089-91	METAL GLAZE 47K 5% 1/10W	(X715)
R855	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	(X715)
R856	1-216-089-91	METAL GLAZE 47K 5% 1/10W	(X715)
R857	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	(X715)
R858	1-216-093-00	METAL GLAZE 68K 5% 1/10W	(X715)
R859	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	(X715)
R871	1-216-077-00	METAL CHIP 15K 5% 1/10W	(X715)
R872	1-216-095-00	METAL GLAZE 82K 5% 1/10W	(X715)
R873	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	(X715)
R874	1-216-075-00	METAL CHIP 12K 5% 1/10W	
R881	1-216-081-00	METAL CHIP 22K 5% 1/10W	
⚠R882	1-249-389-11	CARBON 4.7 5% 1/4W F	(X715)
⚠R882	1-249-395-11	CARBON 4.7 5% 1/4W F	(X815)
R885	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R886	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R887	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R891	1-216-083-00	METAL CHIP 27K 5% 1/10W	(X715)
R892	1-249-394-11	CARBON 12K 5% 1/4W	(X715)
		< VARIABLE RESISTOR >	
RV521	1-241-763-11	RES, ADJ, CERMET 4.7K	(X815)
RV522	1-241-885-11	RES, ADJ, CERMET 470K	(X815)
RV531	1-241-763-11	RES, ADJ, CERMET 4.7K	(X815)
RV532	1-241-885-11	RES, ADJ, CERMET 470K	(X815)
RV541	1-241-764-11	RES, ADJ, CERMET 10K	(X815)
		< SWITCH >	
S251	1-570-953-11	SWITCH, PUSH (1 KEY) (REC PRF)	
S701	1-571-588-11	SWITCH, SLIDE (RF UNIT CH3/CH4)	
S902	1-762-207-11	SWITCH, SLIDE (NTSC PB)	
		< TRANSFORMER >	
T881	1-423-413-11	TRANSFORMER, BIAS OSCILLATION	(X715)
T881	1-423-414-11	TRANSFORMER, BIAS OSCILLATION	(X815)
T891	1-423-415-11	TRANSFORMER, BIAS OSCILLATION	(X715)
		< TUNER >	
⚠TU702	1-693-319-11	TUNER, RF MOD/IF (BTF-2MG402)	
		< VIBRATOR >	
X201	1-760-494-11	VIBRATOR, CRYSTAL (16MHz)	
X202	1-579-463-11	VIBRATOR, CRYSTAL (32.768kHz)	
X402	1-577-289-11	VIBRATOR, CRYSTAL (14MHz)	

Ref. No.	Part No.	Description	Remark
*	A-6782-912-A	MF-285 BOARD, COMPLETE	(X825)
*	A-6782-901-A	MF-285 BOARD, COMPLETE	(X835)
		**********************	
			(Ref. No. 1,000 Series)
		< CAPACITOR >	
C201	1-163-035-00	CERAMIC CHIP 0.047u	50V (X835)
		< CONNECTOR >	
CN201	1-695-368-31	CONNECTOR, FFC/FPC 7P	
		< LED >	
D201	8-719-056-07	LED SLR-342MC3F	
D202	8-719-056-07	LED SLR-342MC3F	
		< IC >	
IC201	1-466-833-11	IC RAY-CATCHER BLOCK, REMOCON	(X835)
		< TRANSISTOR >	
Q201	8-729-421-22	TRANSISTOR UN2211	
		< RESISTOR >	
R201	1-216-089-91	METAL GLAZE 47K 5% 1/10W	(X835)
R202	1-216-021-00	METAL CHIP 68 5% 1/10W	
		< SWITCH >	
S201	1-571-977-11	SWITCH, TACTIL (POWER)	
*	A-6782-795-A	MF-290 BOARD, COMPLETE	(X715, X815)
		**********************	
			(Ref. No. 2,000 Series)
		< CONNECTOR >	
CN201	1-691-068-21	HOUSING, CONNECTOR 9P	
		< LED >	
D201	8-719-056-07	LED SLR-342MC3F (POWER)	
D202	8-719-056-07	LED SLR-342MC3F (POWER)	
		< RESISTOR >	
R202	1-216-021-00	METAL CHIP 68 5% 1/10W	
		< SWITCH >	
S201	1-571-977-11	SWITCH, TACTIL (POWER)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

PS-357 PS-368

Ref. No.	Part No.	Description	Remark
*	A-6782-908-A	PS-357 BOARD, COMPLETE	(X825AS,X835AS)
*	A-6782-905-A	PS-357 BOARD, COMPLETE	(X825MI/MN/MNB,X835ME/MN)
*	A-6782-820-A	PS-368 BOARD, COMPLETE	(X715)
*	A-6782-819-A	PS-368 BOARD, COMPLETE	(X815)

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(Ref. No. 1,000 Series)

Ref. No.	Part No.	Description	Remark
	1-533-223-11	HOLDER, FUSE	
*	3-951-893-01	HEAT SINK	
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
⚠C101	1-104-706-11	FILM 0.022uF 20% 250V	(X825AS,X835AS)
⚠C101	1-104-705-11	FILM 0.1uF 20% 250V	(EXCEPT X825AS,X835AS)
⚠C102	1-104-705-11	FILM 0.1uF 20% 250V	
⚠C103	1-107-405-11	ELECT 68uF 20% 400V	(X825AS,X835AS)
⚠C103	1-107-414-11	ELECT 220uF 20% 400V	(EXCEPT X825AS,X835AS)
⚠C104	1-113-935-11	ELECT 0.001uF 99% 125V	
⚠C105	1-113-935-11	ELECT 0.001uF 99% 125V	
⚠C106	1-113-935-11	ELECT 0.001uF 99% 125V	
⚠C107	1-113-935-11	ELECT 0.001uF 99% 125V	
⚠C108	1-113-935-11	ELECT 0.001uF 99% 125V	
C112	1-113-895-11	ELECT 150PF 10% 250V	(EXCEPT X825AS,X835AS)
C121	1-126-935-11	ELECT 470uF 20% 16V	
C122	1-126-926-11	ELECT 1000uF 20% 10V	
C125	1-128-551-11	ELECT 22uF 20% 25V	
C131	1-128-499-11	ELECT 220uF 20% 16V	
C132	1-128-551-11	ELECT 22uF 20% 25V	
C133	1-104-664-11	ELECT 47uF 20% 25V	
C141	1-126-967-11	ELECT 47uF 20% 16V	
C142	1-126-933-11	ELECT 100uF 20% 16V	
C161	1-126-967-11	ELECT 47uF 20% 16V	
C162	1-126-924-11	ELECT 330uF 20% 10V	
C171	1-126-924-11	ELECT 330uF 20% 10V	
C181	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C182	1-126-967-11	ELECT 47uF 20% 16V	
C183	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C184	1-126-967-11	ELECT 47uF 20% 50V	
C185	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C186	1-126-967-11	ELECT 47uF 20% 50V	
C187	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C188	1-126-967-11	ELECT 47uF 20% 50V	
C189	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C190	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C191	1-124-248-00	ELECT 22uF 20% 35V	(X815,X825,X835)

< AC INLET >

Ref. No.	Part No.	Description	Remark
⚠CJ101	1-251-134-11	INLET, AC (NONPOLAR) (AC IN ~)	

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN101	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P	

< POWER BLOCK >

Ref. No.	Part No.	Description	Remark
⚠CP101	1-468-084-11	POWER BLOCK	(X825AS,X835AS)
⚠CP101	1-468-083-11	POWER BLOCK	(EXCEPT X825AS,X835AS)
⚠CP102	1-467-811-12	UNIT, DC-DC CONVERTER	

< DIODE >

Ref. No.	Part No.	Description	Remark
⚠D101	8-719-510-06	DIODE S1WB60	
D161	8-719-911-19	DIODE 1SS119-25	
D162	8-719-109-85	DIODE RD5.1ES-B2	

< FUSE >

Ref. No.	Part No.	Description	Remark
⚠F101	1-532-203-00	FUSE (T2AL/250V)	

< IC >

Ref. No.	Part No.	Description	Remark
⚠IC141	8-759-189-48	IC PQ12RE11	

< COIL >

Ref. No.	Part No.	Description	Remark
⚠L121	1-403-588-11	CIL, CHOKE 22uH	
⚠L122	1-403-588-11	CIL, CHOKE 22uH	
L181	1-408-970-21	INDUCTOR 10uH	
L182	1-414-142-11	INDUCTOR 1uH	
L183	1-414-142-11	INDUCTOR 1uH	

< LINE FILTER >

Ref. No.	Part No.	Description	Remark
⚠LF102	1-403-599-11	FILTER, LINE 33mH	(X825AS,X835AS)
⚠LF102	1-424-117-11	FILTER, LINE 18mH	(EXCEPT X825AS,X835AS)
⚠LF103	1-403-599-11	FILTER, LINE 33mH	(X825AS,X835AS)
⚠LF103	1-424-117-11	FILTER, LINE 18mH	(EXCEPT X825AS,X835AS)

< IC LINK >

Ref. No.	Part No.	Description	Remark
⚠PS121	1-532-637-00	LINK, IC ICP-N25 (1.0A)	
⚠PS122	1-532-637-00	LINK, IC ICP-N25 (1.0A)	
⚠PS123	1-532-637-00	LINK, IC ICP-N25 (1.0A)	
⚠PS181	1-532-605-00	LINK, IC ICP-N10 (0.4A)	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
⚠Q131	8-729-140-93	TRANSISTOR 2SB733-34	
Q132	8-729-421-22	TRANSISTOR UN2211	
⚠Q161	8-729-140-98	TRANSISTOR 2SD773-34	

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Ref. No.	Part No.	Description				Remark
		< RESISTOR >				
⚠R101	1-214-947-00	METAL	2.7M	1%	1/2W	
R125	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R131	1-249-417-11	CARBON	1K	5%	1/4W	
R132	1-216-430-11	METAL OXIDE	390	5%	1W	F
R133	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R141	1-216-089-91	METAL GLAZE	47K	5%	1/10W	
R161	1-249-412-11	CARBON	390	5%	1/4W	
R182	1-216-378-11	METAL OXIDE	5.6	5%	2W	F
R183	1-216-480-11	METAL OXIDE	820	5%	3W	F

* A-6782-902-A RP-199 BOARD, COMPLETE (X825,X835)
* A-6782-923-A RP-203 BOARD, COMPLETE (X715)
* A-6782-918-A RP-203 BOARD, COMPLETE (X815)
****
(Ref. No. 1,000 Series)

Ref. No.	Part No.	Description				Remark
		< CAPACITOR >				
C501	1-163-237-11	CERAMIC CHIP	27PF	5%	50V	
C502	1-163-237-11	CERAMIC CHIP	27PF	5%	50V	
C503	1-163-033-91	CERAMIC CHIP	0.022uF		50V	
C504	1-163-033-91	CERAMIC CHIP	0.022uF		50V	
C505	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C506	1-163-033-91	CERAMIC CHIP	0.022uF		50V	
C507	1-163-235-11	CERAMIC CHIP	22PF	5%	50V	
C508	1-163-235-11	CERAMIC CHIP	22PF	5%	50V	
C509	1-163-033-91	CERAMIC CHIP	0.022uF		50V	
C510	1-163-033-91	CERAMIC CHIP	0.022uF		50V	
C511	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	
C512	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	
C513	1-163-033-91	CERAMIC CHIP	0.022uF		50V	
C514	1-163-033-91	CERAMIC CHIP	0.022uF		50V	
C515	1-163-033-91	CERAMIC CHIP	0.022uF		50V	
C516	1-163-033-91	CERAMIC CHIP	0.022uF		50V	
C517	1-163-033-91	CERAMIC CHIP	0.022uF		50V	
C518	1-124-584-00	ELECT	100uF	20%	10V	
C519	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C521	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C522	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C523	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V	
C524	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	
C525	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	
C526	1-124-584-00	ELECT	100uF	20%	10V	
C527	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C528	1-163-127-00	CERAMIC CHIP	270PF	5%	50V	
C529	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C531	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C532	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C760	1-163-031-11	CERAMIC CHIP	0.01uF		50V	(X815,X825,X835)
C761	1-124-584-00	ELECT	100uF	20%	10V	(X815,X825,X835)
C762	1-163-031-11	CERAMIC CHIP	0.01uF		50V	(X815,X825,X835)
C763	1-163-038-91	CERAMIC CHIP	0.1uF		25V	(X815,X825,X835)
C764	1-124-257-00	ELECT	2.2uF	20%	50V	(X815,X825,X835)
C765	1-163-031-11	CERAMIC CHIP	0.01uF		50V	(X815,X825,X835)
C767	1-163-031-11	CERAMIC CHIP	0.01uF		50V	(X815,X825,X835)
C768	1-163-135-00	CERAMIC CHIP	560PF	5%	50V	(X815,X825,X835)
C769	1-163-135-00	CERAMIC CHIP	560PF	5%	50V	(X815,X825,X835)
C770	1-163-038-91	CERAMIC CHIP	0.1uF		25V	(X815,X825,X835)
C773	1-163-031-11	CERAMIC CHIP	0.01uF		50V	(X815,X825,X835)
C774	1-163-031-11	CERAMIC CHIP	0.01uF		50V	(X815,X825,X835)
C775	1-126-160-11	ELECT	1uF	20%	50V	(X815,X825,X835)
C776	1-163-031-11	CERAMIC CHIP	0.01uF		50V	(X815,X825,X835)
C901	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C902	1-163-224-11	CERAMIC CHIP	7PF	0.25PF	50V	
C903	1-163-243-11	CERAMIC CHIP	47PF	5%	50V	
C904	1-163-249-11	CERAMIC CHIP	82PF	5%	50V	
C905	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
C906	1-163-038-91	CERAMIC CHIP	0.1uF		25V	
C907	1-126-967-11	ELECT	47uF	20%	16V	
C909	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
C912	1-163-241-11	CERAMIC CHIP	39PF	5%	50V	
R519	1-163-031-11	CERAMIC CHIP	0.01uF		50V	
		< CONNECTOR >				
CN501	1-563-585-11	CONNECTOR, FLEXIBLE 8P				(X715)
CN501	1-766-986-11	CONNECTOR, FFC/FPC 13P				(X815,X825,X835)
* CN502	1-564-029-00	PIN, CONNECTOR 4P				
CN503	1-766-720-11	CONNECTOR, BOARD TO BOARD 17P				
CN701	1-766-724-11	CONNECTOR, BOARD TO BOAR 7P				
		< IC >				
IC501	8-759-352-17	IC HA118195NT				
IC760	8-759-055-49	IC AN3327K				(X815,X825,X835)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

RP-199 RP-203

Ref. No.	Part No.	Description			Remark
		< JUMPER RESISTOR >			
JR502	1-216-295-00	METAL CHIP	0	5%	1/10W
JR503	1-216-295-00	METAL CHIP	0	5%	1/10W
JR504	1-216-295-00	METAL CHIP	0	5%	1/10W
JR505	1-216-295-00	METAL CHIP	0	5%	1/10W
JR506	1-216-296-00	METAL CHIP	0	5%	1/8W
JR507	1-216-295-00	METAL CHIP	0	5%	1/10W
JR508	1-216-295-00	METAL CHIP	0	5%	1/10W
JR509	1-216-295-00	METAL CHIP	0	5%	1/10W
JR901	1-216-296-00	METAL CHIP	0	5%	1/8W
		< COIL >			
L501	1-414-189-31	INDUCTOR	100uH		
L502	1-414-189-31	INDUCTOR	100uH		
L503	1-410-525-11	INDUCTOR	220uH		
L760	1-414-189-31	INDUCTOR	100uH		(X815, X825, X835)
L901	1-414-189-31	INDUCTOR	100uH		
L903	1-410-515-11	INDUCTOR	33uH		
L904	1-410-511-11	INDUCTOR	15uH		
L905	1-410-511-11	INDUCTOR	15uH		
L906	1-410-516-11	INDUCTOR	39uH		
		< TRANSISTOR >			
Q501	8-729-271-21	TRANSISTOR	2SC2712Y		
Q502	8-729-216-21	TRANSISTOR	2SA1162Y		
Q901	8-729-271-21	TRANSISTOR	2SC2712Y		
Q902	8-729-421-19	TRANSISTOR	UN2213		
Q904	8-729-216-21	TRANSISTOR	2SA1162Y		
Q905	8-729-271-21	TRANSISTOR	2SC2712Y		
		< RESISTOR >			
C520	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R501	1-216-045-00	METAL CHIP	680	5%	1/10W
R502	1-216-045-00	METAL CHIP	680	5%	1/10W
R503	1-216-295-00	METAL CHIP	0	5%	1/10W
R504	1-216-295-00	METAL CHIP	0	5%	1/10W
R505	1-216-295-00	METAL CHIP	0	5%	1/10W
R506	1-216-295-00	METAL CHIP	0	5%	1/10W
R507	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R508	1-216-073-00	METAL CHIP	10K	5%	1/10W
R509	1-216-075-00	METAL CHIP	12K	5%	1/10W
R510	1-216-081-00	METAL CHIP	22K	5%	1/10W
R511	1-216-081-00	METAL CHIP	22K	5%	1/10W
R512	1-216-224-91	METAL GLAZE	12K	5%	1/8W
R513	1-216-081-00	METAL CHIP	22K	5%	1/10W
R514	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R515	1-216-081-00	METAL CHIP	22K	5%	1/10W
R516	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R517	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R518	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R520	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R762	1-216-035-00	METAL CHIP	270	5%	1/10W (X815, X825, X835)
R763	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R765	1-216-033-00	METAL CHIP	220	5%	1/10W (X815, X825, X835)
R766	1-249-418-11	CARBON	1.2K	5%	1/4W F (X815, X825, X835)
R767	1-216-035-00	METAL CHIP	270	5%	1/10W (X815, X825, X835)
R768	1-216-097-91	METAL GLAZE	100K	5%	1/10W (X815, X825, X835)
R771	1-216-079-00	METAL CHIP	18K	5%	1/10W (X815, X825, X835)
R776	1-216-073-00	METAL CHIP	10K	5%	1/10W (X815, X825, X835)
R901	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R902	1-216-075-00	METAL CHIP	12K	5%	1/10W
R903	1-216-077-00	METAL CHIP	15K	5%	1/10W
R904	1-216-041-00	METAL CHIP	470	5%	1/10W (X715, X825, X835)
R905	1-216-031-00	METAL CHIP	180	5%	1/10W
R906	1-216-043-91	METAL GLAZE	560	5%	1/10W
R907	1-216-045-00	METAL CHIP	680	5%	1/10W
R908	1-216-049-91	METAL CHIP	1K	5%	1/10W
R912	1-216-075-00	METAL CHIP	12K	5%	1/10W
R913	1-216-077-00	METAL CHIP	15K	5%	1/10W
R914	1-216-033-00	METAL CHIP	220	5%	1/10W
R916	1-216-033-00	METAL CHIP	220	5%	1/10W
R917	1-216-047-91	METAL GLAZE	820	5%	1/10W
R918	1-216-049-91	METAL GLAZE	1K	5%	1/10W
R919	1-216-295-00	METAL CHIP	0	5%	1/10W
R920	1-216-075-00	METAL CHIP	12K	5%	1/10W
R921	1-216-077-00	METAL CHIP	15K	5%	1/10W
R931	1-216-295-00	METAL CHIP	0	5%	1/10W
R932	1-216-295-00	METAL CHIP	0	5%	1/10W
R933	1-216-295-00	METAL CHIP	0	5%	1/10W (X715)
R933	1-216-073-00	METAL CHIP	10K	5%	1/10W (X815, X825, X835)
R936	1-216-295-00	METAL CHIP	0	5%	1/10W

Ref. No.	Part No.	Description	Remark
		MISCELLANEOUS *************	
13	1-776-226-11	CABLE, FLAT (FHM-1) 9P (X715, X815)	
14	1-776-227-11	CABLE, FLAT (FMM-13) 7P (X835)	
55	1-473-518-61	SWITCH BLOCK, CONTROL (X835MN/ME)	
55	1-473-518-71	SWITCH BLOCK, CONTROL (X835AS)	
72	1-776-227-11	CABLE, FLAT (FMM-13) 7P	
103	1-776-228-11	CABLE, FLAT (FDL-1) 10P (X835)	
107	1-776-225-11	CABLE, FLAT (FMH-9) 15P	
152	1-500-144-11	HEAD, FE	
162	A-6739-103-A	ACE BLOCK ASSY	
164	1-506-485-11	PIN, CONNECTOR 6P	
220	8-848-623-02	DRUM ASSY, ROTARY UPPER (DZR-67-R) (X815, X825, X835)	
221	8-848-666-11	DRUM ASSY, LOWER (DZR-51/J-RP) (X815, X825, X835)	
223	8-848-682-11	DRUM ASSY, (DZH-74B/Q-RP) (X715)	
M902	1-698-409-11	MOTOR, DC SCV-0801A/Z-NP (CAPSTAN)	
M903	X-3943-883-1	MOTOR ASSY, CAM	
S410	1-572-662-12	SWITCH, ROTARY (DUAL MODE SHUTTLE)	

ACCESSORIES & PACKING MATERIALS
****

Ref. No.	Part No.	Description	Remark
	1-473-481-21	REMOTE COMMANDER (RMT-V181L) (X825)	
	1-473-481-31	REMOTE COMMANDER (RMT-V181M) (X815)	
	1-473-481-41	REMOTE COMMANDER (RMT-V181N) (X715)	
	1-473-486-11	REMOTE COMMANDER (RMT-V185A) (X835)	
⚠	1-569-008-11	ADAPTER, CONVERSION 2P (X715ME/SG, X815ME/SG, X835ME)	
⚠	1-575-131-11	CORD, POWER SUPPLY (X715, X815, X825MN/MNB, X835MN/ME)	
	1-575-334-11	CORD, CONNECTION (AUDIO, VIDEO) (X815, X825, X835)	
⚠	1-590-866-21	CORD, POWER (X825MI)	
	1-696-593-11	CORD, CONNECTION (PAL) (ANT) (1.5m)	
⚠	1-696-819-11	CORD, POWER (X825AS, X835AS)	
	3-708-817-01	COVER, BATTERY (V185) (X835)	
	3-709-062-01	COVER, BATTERY (V181L, V181M, V181N) (X715, X815, X825)	
	3-810-471-11	MANUAL, INSTRUCTION (ENGLISH) (X835MN/ME)	
	3-810-471-21	MANUAL, INSTRUCTION (CHINESE) (X835MN)	
	3-810-471-31	MANUAL, INSTRUCTION (ARABIC) (X835ME)	
	3-810-471-41	MANUAL, INSTRUCTION (RUSSIAN) (X835AS)	
	3-810-472-11	MANUAL, INSTRUCTION (ENGLISH) (X825MN/MNB/MI)	
	3-810-472-21	MANUAL, INSTRUCTION (CHINESE) (X825MN/MNB/MI)	
	3-810-472-31	MANUAL, INSTRUCTION (ARABIC) (X825AS)	
	3-810-473-11	MANUAL, INSTRUCTION (ENGLISH) (X815)	
	3-810-473-21	MANUAL, INSTRUCTION (CHINESE) (X815PS)	
	3-810-473-31	MANUAL, INSTRUCTION (ARABIC) (X815ME/SG)	
	3-810-473-41	MANUAL, INSTRUCTION (PERSIAN) (X815SG)	
	3-810-474-11	MANUAL, INSTRUCTION (ENGLISH) (X715)	
	3-810-474-21	MANUAL, INSTRUCTION (CHINISE) (X715PS)	
	3-810-474-31	MANUAL, INSTRUCTION (ARABIC) (X715ME/SG)	
	3-810-474-41	MANUAL, INSTRUCTION (PERSIAN) (X715SG)	
	3-810-474-51	MANUAL, INSTRUCTION (URDU) (X715SG)	
	3-957-513-11	RING, SHUTTLE (V185) (X835)	
*	3-967-421-11	INDIVIDUAL CARTON (X835MN)	
*	3-967-421-21	INDIVIDUAL CARTON (X835ME)	
*	3-967-421-31	INDIVIDUAL CARTON (X835AS)	
*	3-967-422-21	INDIVIDUAL CARTON (X825MN)	
*	3-967-422-31	INDIVIDUAL CARTON (X825MI)	
*	3-967-422-41	INDIVIDUAL CARTON (X825AS)	
*	3-967-422-51	INDIVIDUAL CARTON (X825MNB)	
*	3-967-570-01	INDIVIDUAL CARTON (X815PS)	
*	3-967-570-11	INDIVIDUAL CARTON (X815ME)	
*	3-967-570-21	INDIVIDUAL CARTON (X815SG)	
*	3-967-570-31	INDIVIDUAL CARTON (X715PS)	
*	3-967-570-41	INDIVIDUAL CARTON (X715ME)	
*	3-967-570-51	INDIVIDUAL CARTON (X715SG)	
*	3-967-323-01	CUSHION (X835)	
*	3-967-324-01	CUSHION (X715, X815, X825)	
	X-3944-446-2	BUTTON ASSY (C) (V185) (X835)	

****
HARDWARE LIST
****

Ref. No.	Part No.	Description	Remark
#1	7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3	
#2	7-685-646-79	SCREW (3X8)	
#3	7-682-547-04	SCREW +P 3X6	
#4	7-624-190-61	STOP RING 2.4, TYPE-CS	
#5	7-624-106-04	STOP RING 3.0, TYPE-E	
#6	7-682-645-01	SCREW +PS 3X4	
#7	7-621-772-08	SCREW +B 2X3	
#8	7-628-254-10	SCREW +PS 2.6X6	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SECTION 6
INTERFACE, ICPIN FUNCTION DESCRIPTION

6-1. SYSTEM CONTROL – VIDEO BLOCK INTERFACE (MA-251 BOARD IC201)

Signal	Pin No.	I/O	STOP FF/ REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
V $\overline{\text{PB}}$	MA-251 IC201(98)	O	H	H	H	L	L	L	L	L	L	H	H
RF SWP	MA-251 IC201①	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	MA-251 IC201②	O	L	L	L	*2	*3	*3	*3	*3	*3	L	L
NA $\overline{\text{SP}}$	MA-251 IC201(94)	O	*4	*4	*4	*5	*5	*5	*5	*5	*5	*4	*4
$\overline{\text{SP}}$/EP/EP: HI - IMP	MA-251 IC201⑫	O	*8	*8	*8	*5	*5	*5	*5	*5	*5	*8	*8
V SYNC	MA-251 IC201(66)	I	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
BLUE BACK ON	MA-251 IC201㉑	O	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
CTL REC	MA-251 IC201(75)	O	L	L	L	L	L	L	L	L	L	H	L
JOG	MA-251 IC201(97)	O	L	L	L	L	H	H	H	H	H	L	L
ORC SETTEI	MA-251 IC201(91)	O	L	L	L	L	L	L	L	L	L	*9	*9
$\overline{\text{NTSC}}$	MA-251 IC201⑤	O	L	L	L	L	L	L	L	L	L	L	L

*1. 25 Hz (PAL)/30 Hz (NTSC) 50% duty pulse synchronizing with drum rotation.
*2. Normally "L". "H" when the video signal is not detected.
*3. V period "H" pulse.
*4. "L" in the SP mode. Selected according to the recording mode.
*5. Selected according to the tape recording mode.

Mode / Signal	SP	LP	EP
SP (93)	L	H	H
$\overline{\text{LP}}$ (92)	L	L	H

*6. Composite Sync signal (positive).
*7. "H" when menu screen or gray back screen.
*8. Selected by REC mode, "L" in the SP mode.
*9. "H" while APC is set.

6-2. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE (MA-251 BOARD IC201)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREAD -ING	TAPE UNTHREAD -ING	PB	PB • PAUSE	SLOW	CUE	×2	REVIEW	REC	REC • PAUSE	PB INDEX WRT/ERS
REC CTL	MA-251 IC201⑦	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	
$\overline{\text{CAP STOP}}$	MA-251 IC201㉟	O (O.D)	L	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	L	*3	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	
STEP PLS	MA-251 IC201(99)	O	L	L	L	L	L	L	L	*2	L	L	L	L	L	
CTL REC	MA-251 IC201(75)	O	L	L	L	L	L	L	L	L	L	L	L	H	L	H
CTL-INDEX	MA-251 IC201(79)	O	L	L	L	L	L	L	L	L	L	L	L	L	L	H
$\overline{\text{PB CTL}}$	MA-251 IC201(67)	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H	
DRUM PG	MA-251 IC201(68)	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7	
DRUM FG	MA-251 IC201(69)	I	*4	*8	*8	*5	*5	*8	*8	*8	*8	*8	*8	*8	*8	
CAP FG	MA-251 IC201(70)	I	H/L	*6	*6	*5	*5	*6	H/L	*9	*6	*6	*6	*6	H/L	
CAP DA	MA-251 IC201(73)	O	*10	*10	*10	*10	*10	*11	*10	*10	*11	*11	*11	*11	*10	
DRUM DA	MA-251 IC201(74)	O	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	
CTL STEP	MA-251 IC201(76)	O	L	L	L	L	L	L	L	*13	L	L	L	L	L	

*1. 30 Hz or 25 Hz pulse.
*2. Pulse at tape running.
*3. Reverse logic pulse of STEP PLS.
*4. "L" when drum rotation stop.
*5. Unstable period pulse.
*6. Pulse of period in proportion to tape speed.
*7. 30 Hz or 25 Hz pulse.
*8. 360 Hz or 300 Hz or 180/150 Hz pulse.
*9. Pulse at tape running.
*10. Approx. 2 msec period "H" or "L" pulse.
*11. Approx. 1.5 msec period "H" or "L" pulse.
*12. Approx. 3 msec period "H" or "L" pulse.
*13. "H" when FWD direction STEP drive.

6-3. SYSTEM CONTROL – MECHANISM INTERFACE (MA-251 BOARD IC201)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TEPE THREAD-ING	TAPE UNTHREAD-ING	STOP	FF	REW	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
CAM LOAD	MA-251 IC201⑬	O	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L
CAM UNLOAD	MA-251 IC201⑭	O	L	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L
CAM 12V	MA-251 IC201㉛	O		H	L	H	L											
MODE 1	MA-251 IC201㉚	I	H	L	L	*1	*1	H	H	H	H	H	H	H	H	L	H	H
MODE 2	MA-251 IC201㉙	I	L	L	L	*1	*1	L	L	L	H	H	H	H	H	H	H	H
MODE 3	MA-251 IC201㉘	I	L	L	L	*1	*1	H	H	H	L	H	H	L	L	H	L	H
MODE 4	MA-251 IC201㉗	I	L	H	H	*1	*1	H	L	L	L	L	L	L	L	L	L	L
C IN (REC PRF)	MA-251 IC201⑮	I	L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
TREEL FG	MA-251 IC201(64)	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
SREEL FG	MA-251 IC201(63)	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
T/E LED	MA-251 IC201㉜	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP TRQ 1	MA-251 IC201㉞	O (O.D)											*1					
CAP TRQ 2	MA-251 IC201㉝	O (O.D)										L	*1					L
CAP TRQ 3	MA-251 IC201⑧	O (O.D)							H	H			*1		H	H		
$\overline{\text{CAP STOP}}$	MA-251 IC201㉟	O (O.D)	L	L	L	H	H	L	H	H	H	L	*5	H	H	H	H	L
CAP RVS	MA-251 IC201(72)	O	H			L	H	H/L	L	H	L	L	L/*5	L	L	H	L	L
CAP DA	MA-251 IC201(73)	O																
T SENS	MA-251 IC201(61)	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
S SENS	MA-251 IC201(62)	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6

*1. Uncertainty.
*2. "L" when erasing protection tab is bent, "H" when not bent.
*3. Pause of period in proportionate to reel rotating speed.
*4. Approx. 2 msec period "H" pulse.
*5. Pulse in tape running.
*6. Normally "L". 2 msec. period "H" pulse when tape top or tape end is detected.

6-4. SYSTEM CONTROL – SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-251 BOARD IC201)

Signal	Pin No.	I/O	I/O level
$\overline{\text{ASURA RESET}}$	MA-251 IC201㊵	I	Normally "H", "L" when service interruption is detected or restored.
$\overline{\text{ASURA CS}}$	MA-251 IC201㊹	I	Chip select signal from the timer microprocessor. V period "L" pulse.
S IN 0	MA-251 IC201㊺	I	Serial communication data from the timer microprocessor. V period "L" pulse.
S OUT 0	MA-251 IC201㊻	O	Serial communication data to the timer microprocessor. V period "L" pulse.
$\overline{\text{S CLK}}$	MA-251 IC201㊼	I	Serial communication clock with the timer microprocessor. V period "L" pulse.

6-5. SYSTEM CONTROL – AUDIO BLOCK INTERFACE (MA-251 BOARD IC201)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
AF ENV	MA-251 IC201(59)	I	AF RF envelope signal input terminal for automatic tracking.										
A MUTE	MA-251 IC201(92)	O (O.D)	L	L	L	*1	H	H	H	H	H	L	L
NA REC $\overline{\text{P}}$	MA-251 IC201⑪	O	L	L	L	L	L	L	L	L	L	H	L
AF REC $\overline{\text{P}}$	MA-251 IC201④	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	MA-251 IC201⑱	O	*1	L	L	*1	*1	*1	*1	*1	*1	*1	*1
$\overline{\text{FULL ERS}}$	MA-251 IC201㊳	O (O.D)	H	H	H	H	H	H	H	H	H	L	H
NA PB	MA-251 IC201(95)	O	L	L	L	H	H	H	H	H	H	L	L
$\overline{\text{NA SP}}$	MA-251 IC201(94)	O	*2	*2	*2	*3	*3	*3	*3	*3	*2	*2	*2

*1. 30 Hz 50% duty pulse approximatery 5 msec. delayed from RF SW P.
*2. Selected according to SP/EP selector. "L" in the SP mode, "H" in the EP mode.
*3. Selected according to the tape recording mode. "L" in the SP mode, "H" in the EP mode.

6-6. SYSTEM CONTROL AND RF MODULATOR – INPUT SELECTION BLOCK INTERFACE

Signal	Pin No.	I/O	I/O level
LINE 1	MA-251 IC201(83)	O	*1. Input select control signal.
LINE 2	MA-251 IC201(82)	O	

*1.

Signal \ Input	Tuner	LINE 1	LINE 2
LINE 1 (83)	L	H	L
LINE 2 (82)	L	L	H

6-7. SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTION (MA-251 BOARD IC201 CXP-87248A-016Q: SLV-X825, X835)

Pin No.	Pin name	I/O	Function
1	RF SWP	O	RF switching pulse output
2	QVD	O	Quasi VD pulse output
3	QHD ENABLE	O	Quasi HD voltage level control
4	AF REC $\overline{\mathrm{P}}$	O	"H" output when hi-fi audio REC
5	$\overline{\mathrm{NTSC}}$	O	"H" PAL "L" when NTSC mode
6	FE ON	O	Flying erase ON/OFF
7	REC CTL	O	REC CTL signal output
8	CAP TRQ3	O	Capstan current control
9	APC2	I	APC control input terminal 2
10	APC1	I	APC control input temimal 1
11	$\overline{\mathrm{NA\ REC}}$ $\overline{\mathrm{P}}$	I/O	Normal audio recording mode H: recording mode
12	$\overline{\mathrm{SP}}$/EP/LP	O	"L" when SP mode "H" when EP/LP mode
13	CAM LOAD	I	Loading motor rotating direction control
14	CAM UNLOAD	I	Loading motor rotating direction control
15	C IN (REC PRF)	I	Erasing protection bab, cassette IN detection input
16	RENTAL	I/O	YNR control
17	NC	O	Not used
18	NC	–	Not used
19	358 NTSC	I	Tuner audio selection signal H: 3.58 XTAL
20	NT JUDGE	I	4.43/3.58 judge input.
21	BLUE BACK ON	O	"H" when BLUE BACK ON mode
22	PAL 60	O	NTSC PB control signal "H" when NTSC PB on pal TV
23	$\overline{\mathrm{TV}}$/VTR	O	"L" when VTR mode "H" when TV mode
24	AV CONT	O	ON/OFF control
25	MESECAM	I/O	"L" in NT mode
26	CBC ON	O	Cable box control on
27	MODE 4	I	Mechanism section CAM encoder input
28	MODE 3	I	Mechanism section CAM encoder input
29	MODE 2	I	Mechanism section CAM encoder input
30	MODE 1	I	Mechanism section CAM encoder input
31	CAM 12V	O	CAM motor reference voltage
32	T/E LED	O	T/E LED output
33	CAP TRQ2	O	Capstan current control signal 2 L: FF/REW to STOP
34	CAP TRQ1	O	Capstan current control signal 1 L: SLOW speed down
35	$\overline{\mathrm{CAP\ STOP}}$	O	Capstan STOP signal output
36	$\overline{\mathrm{FULL\ ERS}}$	O	Full erase control
37	NC	O	Not used
38	NC	O	Not used
39	MP	I	Fixed to L
40	$\overline{\mathrm{ASURA\ RESET}}$	I	System reset input
41	VSS	–	GND
42	XTAL	–	System clock 16 MHz
43	EXTAL	–	System clock 16 MHz
44	$\overline{\mathrm{ASURA\ CS}}$	I	S/S microcomputer chip select signal
45	S IN 0	I	Serial communication signal
46	S OUT 0	O	Serial communication signal
47	$\overline{\mathrm{SCLK}}$	O	Serial communication signal
48	NICOL ON	O	Not used
49	F MONO	O	Tuner Audio Select
50	EDIT	O	EDIT control

Pin No.	Pin name	I/O	Function
51	LINE 3 CONT	O	Input selection control signal 3
52	AVSS	–	UNSW GND
53	AVREF	–	AD port reference input UNSW 5V
54	AVDD	–	UNSW 5V
55	APC ERROR	I	APC error input
56	NTPB SW	I	NTSC PB switch
57	DEST2 DEW	I	DEW sensor input Not used
58	HF ADJ	I	ADJ mode 0V: SWP Adj 2.5V: HiFi Adj
59	AF ENV	I	Hi-Fi audio playback signal envelope
60	RF ENV	I	Video playback signal envelope
61	T SENS	I	Take up end sensor input
62	S SENS	I	Supply end sensor input
63	S REEL FG	I	S side reel FG input
64	T REEL FG	I	T side reel FG input
65	VDD	I	5V
66	V SYNC	I	Composite sync input
67	$\overline{\mathrm{PB\ CTL}}$	I	Playback CTL input
68	DRM PG	I	Drum PG input
69	DRM FG	I	Drum FG input
70	CAP FG	I	Capstan FG input
71	POWER SAVE CONT	O	Not used
72	CAP RVS	O	Capstan reverse control H when Reverse
73	CAP DA	O	Capstan error D/A output
74	DRUM DA	O	Drum PG input
75	CTL REC	O	"H" CTL write
76	CTL STEP	O	CTL amp, STEP operation control
77	VDD	I	5V
78	VDD	O	5V
79	CTL INDEX	O	CTL INDEX signal input
80	S$\overline{\mathrm{O}}$1	I/O	Signal for serial communication
81	$\overline{\mathrm{SCLK1}}$	I/O	Signal for serial communication
82	LINE 2 CONT	I	Input selection control signal 2
83	LINE 1 CONT	O	Input selection control signal
84	APC PWM	O	PWM output for APC
85	NC	I	Not used
86	NC	–	Not used
87	NC	–	Not used
88	VSS	–	GND
89	VDD	–	5V
90	NC		Not used
91	ORC SETTEI	O	H when ORC measurement
92	A MUTE	O	"H" when audio Mute
93	$\overline{\mathrm{SP}}$	O	Tape speed Select
94	NA $\overline{\overline{\mathrm{SP}}}$	O	Normal audio Tape speed select
95	NA PB	O	Audio output control signal H when normal audio playback
96	AF REC	O	"H" output when hi-fi audio REC
97	JOG	O	"H" when trick play mode
98	$\overline{\mathrm{V}}$ $\overline{\mathrm{PB}}$	O	Video system playback mode "L" when playback
99	STEP PLS	O	Step pulse H when Capstan step driving
100	AF SWP	O	AF switching pulse output

6-8. TUNER/TIMER MODE CONTROL PIN FUNCTION (MA-251 BOARD IC151 CXP82948-002Q)

Pin. No.	Pin Name	I/O	Function
1	$\overline{\mathrm{PDC\text{-}DAV}}$	I	Not used
2	$\overline{\mathrm{PAWER\ FAIL}}$	I	Power failure detect signal input.
3	H DET	I	Video signal detect signal input
4	SIRCS IN	I	SIRCS signal input
5	EEP BUSY	I	EEP Busy signal input
6	SW1	O	Tuner mode input
7	BUZZER	O	Buzzer output
8	SW2	O	Not used
9	EEP $\overline{\mathrm{RST}}$	O	EEP ROM reset signal output (stereo)
10	SCK0	O	Clock for serial communication
11	SI0	I	Serial data input
12	SO0	O	Serial data output
13	EEP $\overline{\mathrm{CS}}$	O	EEP ROM chip select signal output
14	LANC IN	I	LANC input
15	LANCE OUT	O	LANC output
16	KEY-A/D0	I	Key reading A/D input
17	KEY-A/D1	I	Key reading A/D input
18	KEY-A/D2	I	Key reading A/D input
19	KEY-A/D3	I	Key reading A/D input
20	KEY-A/D4	I	Key reading A/D input
21	KEY-A/D5	I	Key reading A/D input
22	KEY-A/D6	I	Key reading A/D input
23	AFT	I	Key reading A/D input
24	AVDD	–	UNSW 5V
25	AV REF	–	AD port reference input UNSW 5V
26	SCL0	O	I^2C BUS (clock)
27	CG $\overline{\mathrm{CS}}$	O	Character generator chip select signal
28	SDA0	O	I^2C BUS (data)
29	LED $\overline{\mathrm{CS}}$	O	LED driver chip select signal
30	AVSS	–	UNSW GND
31	EXTAL	–	System clock Not used
32	XTAL	–	
33	VSS	–	GND
34	$\overline{\mathrm{RST}}$	I	Reset signal in
35	PLL CLK	O	Tuner clock signal
36	PLL DATA	O	Tuner data signal
37	PLL ENABLE	O	Tuner enable signal
38	C+DATA	O	Not used
39	C+DET	I	Not used
40	C+CLK	O	Not used
41	TA MUTE	O	Tuner audio mute control signal
42	AUTO RESET	O	"H" during auto preset
43	VFDP	–	–30V
44-62	SEG 1-19	O	LCD segment output
63	N.C.	–	Not used
64	N.C.	–	Not used
65	N.C.	–	Not used
66-71	GRID 6-1	O	LCD grid output
72	VDD	–	UNSW 5V
73	TX	–	Connected to oscillator for clock
74	TEX	–	
75	NC/VPP	–	Connect to +5V
76	ASURA $\overline{\mathrm{CS}}$	O	S/S microcomputer chip select
77	$\overline{\mathrm{SYS\ RESET}}$	O	System reset signal output
78	POWER CONT 1	O	Power supply control signal output
79	POWER CONT 2	O	Power supply control signal output for EDS
80	CG V	I	Vertical sync. signal input

6-9. SYSTEM CONTROL – VIDEO BLOCK INTERFACE (MA-252 BOARD IC201)

Signal	Pin No.	I/O	STOP FF/ REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
$\overline{\text{V PB}}$	MA-252 IC201(98)	O	H	H	H	L	L	L	L	L	L	H	H
RF SW	MA-252 IC201①	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	MA-252 IC201②	O	L	L	L	*2	*3	*3	*3	*3	*3	L	L
NA $\overline{\text{SP}}$	MA-252 IC201(94)	O	*4	*4	*4	*5	*5	*5	*5	*5	*5	*4	*4
$\overline{\text{SP}}$/EP/EP	MA-252 IC201⑫	O	*8	*8	*8	*5	*5	*5	*5	*5	*5	*8	*8
V SYNC	MA-252 IC201(66)	I	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
CTL REC	MA-252 IC201(75)	O	L	L	L	L	L	L	L	L	L	H	L
$\overline{\text{NTSC}}$	MA-252 IC201⑥	O	L	L	L	L	L	L	L	L	L	L	L
JOG	MA-252 IC201(97)	O	L	L	L	L	H	H	H	H	H	L	L
ORC SETTEI	MA-252 IC201(91)	O	L	L	L	L	L	L	L	L	L	*9	*9

*1. 25 Hz (PAL)/30 Hz (NTSC) 50% duty pulse synchronizing with drum rotation.
*2. Normally "L". "H" when the video signal is not detected.
*3. V period "H" pulse.
*4. "L" in the SP mode. Selected according to the recording mode.
*5. Selected according to the tape recording mode.

Signal \ Mode	SP	LP	EP
SP (93)	L	H	H
$\overline{\text{SP}}$/LP/EP ⑫	L	H	L

*6. Composite Sync signal (positive).
*7. "H" when menu screen or gray back screen.
*8. Selected by REC mode, "L" in the SP mode.
*9. "H" while APC is set.

6-10. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE (MA-252 BOARD IC201)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREAD -ING	TAPE UNTHREAD -ING	PB	PB • PAUSE	SLOW	CUE	×2	REVIEW	REC	REC • PAUSE	PB INDEX WRT/ERS
REC CTL	MA-252 IC201⑦	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	
$\overline{\text{CAP STOP}}$	MA-252 IC201㉟	O (O.D)	L	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	L	*3	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	
STEP PLS	MA-252 IC201(99)	O	L	L	L	L	L	L	L	*2	L	L	L	L	L	
CTL REC	MA-252 IC201(75)	O	L	L	L	L	L	L	L	L	L	L	L	H	L	H
CTL-INDEX	MA-252 IC201(79)	O	L	L	L	L	L	L	L	L	L	L	L	L	L	H
$\overline{\text{PB CTL}}$	MA-252 IC201(67)	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H	
DRUM PG	MA-252 IC201(68)	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7	
DRUM FG	MA-252 IC201(69)	I	*4	*8	*8	*5	*5	*8	*8	*8	*8	*8	*8	*8	*8	
CAP FG	MA-252 IC201(70)	I	H/L	*6	*6	*5	*5	*6	H/L	*9	*6	*6	*6	*6	H/L	
CAP DA	MA-252 IC201(73)	O	*10	*10	*10	*10	*10	*11	*10	*10	*11	*11	*11	*11	*10	
DRUM DA	MA-252 IC201(74)	O	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	
CTL STEP	MA-252 IC201(76)	O	L	L	L	L	L	L	L	*13	L	L	L	L	L	

*1. 30 Hz or 25 Hz pulse.
*2. Pulse at tape running.
*3. Reverse logic pulse of STEP PLS.
*4. "L" when drum rotation stop.
*5. Unstable period pulse.
*6. Pulse of period in proportion to tape speed.
*7. 30 Hz or 25 Hz pulse.
*8. 360 Hz or 300 Hz or 180/150 Hz pulse.
*9. Pulse at tape running.
*10. Approx. 2 msec period "H" or "L" pulse.
*11. Approx. 1.5 msec period "H" or "L" pulse.
*12. Approx. 3 msec period "H" or "L" pulse.
*13. "H" when FWD direction STEP drive.

6-11. SYSTEM CONTROL – MECHANISM INTERFACE (MA-252 BOARD IC201)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TEPE THREAD-ING	TAPE UNTHREAD-ING	STOP	FF	REW	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
CAM LOAD	MA-252 IC201⑬	O	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L
CAM UNLOAD	MA-252 IC201⑭	O	L	L	H	L	H	L	L	L	L	L	L	L	L	L	L	L
CAM 12V	MA-252 IC201㉛	O		H	L	H	L											
MODE 1	MA-252 IC201㉚	I	H	L	L	*8	*8	H	H	H	H	H	H	H	H	L	H	H
MODE 2	MA-252 IC201㉙	I	L	L	L	*8	*8	L	L	L	H	H	H	H	H	H	H	H
MODE 3	MA-252 IC201㉘	I	L	L	L	*8	*8	H	H	H	L	H	H	L	L	H	L	H
MODE 4	MA-252 IC201㉗	I	L	H	H	*8	*8	H	L	L	L	L	L	L	L	L	L	L
C IN (REC PRF)	MA-252 IC201⑮	I	L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
TREEL FG	MA-252 IC201(64)	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
SREEL FG	MA-252 IC201(63)	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
T/E LED	MA-252 IC201㉜	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP TRQ 1	MA-252 IC201㉞	O (O.D)											*8					
CAP TRQ 2	MA-252 IC201㉝	O (O.D)										L	*8					L
CAP TRQ 3	MA-252 IC201⑧	O (O.D)							H	H			*8		H	H		
$\overline{\text{CAP STOP}}$	MA-252 IC201㉟	O (O.D)	L	L	L	H	H	L	H	H	H	L	*5	H	H	H	H	L
CAP RVS	MA-252 IC201(72)	O	H			L	H	H/L	L	H	L	L	L/*5	L	L	H	L	L
CAP DA	MA-252 IC201(73)	O																
T SENS	MA-252 IC201(61)	I	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
S SENS	MA-252 IC201(62)	I	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7

*1. "H" when mechanism mode transition.
*2. "L" when erasing protection tab is bent, "H" when not bent.
*3. Pause of period in proportion to reel rotating speed.
*4. Approx. 2 msec period "H" pulse.
*5. Pulse at tape running.
*6. "L" when tape running and CAP RVS is "H".
*7. Normally "L". 2 msec period "H" pulse when tape top or tape end is detected.
*8. Uncertainty.

6-12. SYSTEM CONTROL – SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-252 BOARD IC201)

Signal	Pin No.	I/O	I/O level
$\overline{\text{ASURA RESET}}$	MA-252 IC201㊵	I	Normally "H", "L" when service interruption is detected or restored.
ASURA $\overline{\text{CS}}$	MA-252 IC201㊹	I	Chip select signal from timer microprocessor. V period "L" pulse.
S IN 0	MA-252 IC201㊺	I	Serial communication data from timer microprocessor. V period "L" pulse.
S OUT 0	MA-252 IC201㊻	O	Serial communication data to timer microprocessor. V period "L" pulse.
SCK0	MA-252 IC201㊼	O	Serial communication clock with timer microprocessor. V period "L" pulse.

6-13. SYSTEM CONTROL – AUDIO BLOCK INTERFACE (MA-252 BOARD IC201)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
AF ENV	MA-252 IC201(59)	I	AF RF envelope signal input terminal for automatic tracking.										
A MUTE	MA-252 IC201⑰	O (O.D)	L	L	L	*1	H	H	H	H	H	L	L
NA REC $\bar{P}$	MA-252 IC201⑪	O	L	L	L	L	L	L	L	L	L	H	L
AF REC $\bar{P}$	MA-252 IC201④	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	MA-252 IC201⑱	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
$\overline{\text{FULL ERS}}$	MA-252 IC201㊱	O (O.D)	H	H	H	H	H	H	H	H	H	L	H
NA PB	MA-252 IC201(95)	O	L	L	L	H	H	H	H	H	H	H	H
$\overline{\text{NA SP}}$	MA-252 IC201(94)	O	*2	*2	*2	*3	*3	*3	*3	*3	*2	*2	*2

*1. 30 Hz 50% duty pulse approx. 5 msec. delayed from RF SW P.
*2. Selected by REC mode selector. SP mode: "L".
*3. Selected by tape recording mode. SP mode: "L".

6-14. SYSTEM CONTROL – NORMAL AUDIO BLOCK INTERFACE (MA-252 BOARD IC201)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	PB • PAUSE	SLOW	×2	CUE	REVIEW	REC	REC • PAUSE
AF ENV	MA-252 IC201(59)	I	AF RF envelope signal input terminal for automatic tracking.										
NA PB	MA-252 IC201(95)	O	L	L	L	H	H	H	H	H	H	L	L
A MUTE	MA-252 IC201⑰	O (O.D)	L	L	L	*1	H	H	H	H	H	L	L
$\overline{\text{NA SP}}$	MA-252 IC201(94)	O	*2	*2	*2	*3	*3	*3	*3	*3	*2	*2	*2
NA REC $\bar{\text{P}}$	MA-252 IC201⑪	O	L	L	L	L	L	L	L	L	L	H	L
AF REC $\bar{\text{P}}$	MA-252 IC201④	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	MA-252 IC201⑩	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
$\overline{\text{FULL ERS}}$	MA-252 IC201㊱	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. 30 Hz 50% duty pulse approx. 5 msec delayed from RF SW P.
*2. Selected by REC mode selector. SP mode: "L".
*3. Selected by tape recording mode. SP mode: "L".

6-15. SYSTEM CONTROL AND RF MODULATOR – INPUT SELECTION BLOCK INTERFACE

Signal	Pin No.	I/O	I/O level
LINE 1	MA-252 IC201⑤	O	*1. Input select control signal.
LINE 2	MA-252 IC201(83)	O	

*1.

Input / Signal	Tuner	LINE 1	LINE 2
LINE 1 ⑤	L	H	L
LINE 2 (83)	L	L	H

6-16. SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTION (MA-252 BOARD IC201 CXP87360-030Q: SLV-X715, X815)

Pin No.	Pin name	I/O	Function
1	RF SWP	O	RF switching pulse output
2	QVD	O	Quasi VD pulse output
3	QHD ENABLE	O	Quasi HD voltage level control
4	AF REC $\overline{P}$	O	"H" output when hi-fi audio REC
5	LINE1	O	Input selsct control signal output
6	$\overline{NTSC}$	O	"H" PAL "L" when NTSC mode
7	REC CTL	O	REC CTL signal output
8	CAP TRQ3	O	Capstan current control
9	APC2	I	APC control input terminal 2
10	APC1	I	APC control input temimal 1
11	$\overline{NA\ REC\ P}$	I/O	Normal audio recording mode H: recording mode
12	$\overline{SP}$/EP/LP	O	"L" when SP mode "H" when EP/LP mode
13	CAM LOAD	O	Loading motor rotating direction control
14	CAM UNLOAD	O	Loading motor rotating direction control
15	C IN (REC PRF)	I	Erasing protection bab, cassette IN detection input
16	RENTAL	I/O	YNR control
17	A MUTE	O	Audio signal Mute control
18	NC	–	Not used
19	358 NTSC	I	Tuner audio selection signal H: 3.58 XTAL
20	BG/$\overline{DK}$	I	
21	ME SECAM	I/O	"L" in NT mode
22	PAL 60	O	NTSC PB control signal "H" when NTSC PB on pal TV
23	SYS CHECK	O	System clock control signal
24	TU CLOCK	O	Tuner control signal
25	TU DATA	I/O	Tuner control signal
26	TU ENABLE	O	Tuner control signal
27	MODE 4	I	Mechanism section CAM encoder input
28	MODE 3	I	Mechanism section CAM encoder input
29	MODE 2	I	Mechanism section CAM encoder input
30	MODE 1	I	Mechanism section CAM encoder input
31	CAM 12V	O	CAM motor reference voltage
32	T/E LED	O	T/E LED output
33	CAP TRQ2	O	Capstan current control signal 2 L: FF/REW to STOP
34	CAP TRQ1	O	Capstan current control signal 1 L: SLOW speed down
35	$\overline{CAP\ STOP}$	O	Capstan STOP signal output
36	$\overline{FULL\ ERS}$	O	Full erase control
37	EEP RESET	O	EEP ROM RESET pulse output
38	EEP CS	O	EEP ROM Select
39	MP	I	Fixed to L
40	$\overline{ASURA\ RESET}$	I	System reset input
41	VSS	–	GND
42	XTAL	–	System clock 16 MHz
43	EXTAL	–	System clock 16 MHz
44	ASURA $\overline{CS}$	I	S/S microcomputer chip select signal
45	S IN 0	I	Serial communication signal
46	S OUT 0	O	Serial communication signal
47	$\overline{SCKO}$	O	Serial communication signal
48	OSD $\overline{CS}$	O	OSD select signal
49	SYS REST	O	System reset output
50	FLD $\overline{CS}$	O	FLD select
51	POWER CONT	O	Power supply control
52	AVSS	–	UNSW GND
53	AVREF	–	AD port reference input UNSW 5V
54	AVDD	–	UNSW 5V
55	APC ERROR	I	APC error input
56	AFT	I	AFT signal input
57	DEST/ DEW	I	DEW sensor input Not used
58	HF ADJ	I	ADJ mode 0V: SWP Adj 2.5V: HiFi Adj
59	AF ENV	I	Hi-Fi audio playback signal envelope
60	RF ENV	I	Video playback signal envelope
61	T SENS	I	Take up end sensor input
62	S SENS	I	Supply end sensor input
63	S REEL FG	I	S side reel FG input
64	T REEL FG	I	T side reel FG input
65	$\overline{H\ DET}$	I	Video signal detect
66	V SYNC	I	Composite sync input
67	$\overline{PB\ CTL}$	I	Playback CTL input
68	DRM PG	I	Drum PG input
69	DRM FG	I	Drum FG input
70	CAP FG	I	Capstan FG input
71	AUTO PRESET	O	"H" during auto preset
72	CAP RVS	O	Capstan reverse control H when Reverse
73	CAP DA	O	Capstan error D/A output
74	DRUM DA	O	Drum PG input
75	CTL REC	O	"H" CTL write
76	CTL STEP	O	CTL amp, STEP operation control
77	EEP BUSY	I	EEP ROM Busy signal
78	NT JUDGE	I	4.43/3.58 judge input
79	CTL INDEX	O	CTL INDEX signal input
80	S$\overline{O}$1	I/O	Signal for serial communication
81	$\overline{SCLK1}$	I/O	Signal for serial communication
82	$\overline{POWER\ FAIL}$	I	power failure detec signal input
83	LINE 2 CONT	O	Input selection control signal 2
84	APC PWM	O	PWM output for APC
85	RMC	I	Remote control input
86	TEX	–	Clock terminal (32 kHz)
87	TX	–	Clock terminal (32 kHz)
88	VSS	–	GND
89	VDD	–	5V
90	NC		Not used
91	ORC SETTEI	O	H when ORC measurement
92	A MUTE	O	"H" when audio Mute
93	$\overline{SP}$	O	Tape speed Select
94	$\overline{NA}$ $\overline{SP}$	O	Normal audio tape speed select
95	NA PB	O	Audio output control signal H when normal audio playback
96	AF REC	O	"H" output when hi-fi audio REC
97	JOG	O	"H" when trick play mode
98	$\overline{V\ PB}$	O	Video system playback mode "L" when playback
99	STEP PLS	O	Step pulse H when Capstan step driving
100	AF SWP	O	AF switching pulse output

SECTION 7
ADJUSTMENTS

During the adjustment, see the Parts Arrangement Diagram for Adjustment on page 7-10.

7-1. MECHANICAL ADJUSTMENTS

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT IV.

7-2. ELECTRICAL ADJUSTMENTS

2-1. PRE-ADJUSTMENT PREPARATIONS

Necessary items and indications for total adjustment of electric circuit of this machine will be described in this chapter.

2-1-1. Instruments to be Used.

1) Color TV
2) Oscilloscope 1or 2 phenomena, band more than 30 MHz, deley mode, as provided.
3) Frequency counter (min. 8 digits)
4) PAL/NTSC pattern generator
5) Digital voltmeter
6) Audio level meter
7) Audio generator
8) Modulation Analyzer
9) Distortion factor meter
10) Attenuator
11) Alignmeter tape
    Part Code: H-7099-052-H (MH-2) (PAL)
    Part Code: 8-192-605-32 (KRV-51N2) (NTSC)
13) Extension cable (13P)
    Part code: J-6090-054-A
    RP-199/203 (CN501) ↔ DRUM

2-1-2. Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

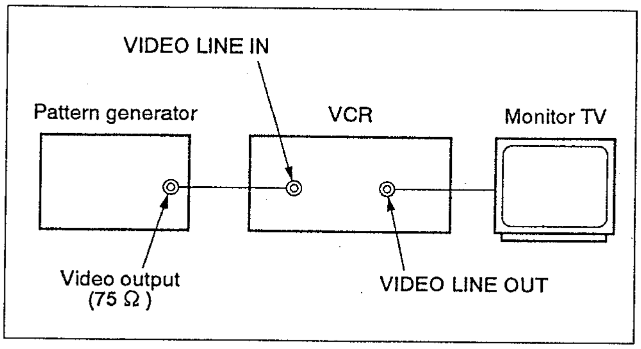

VIDEO LINE IN
Pattern generator
VCR
Monitor TV
Video output (75 Ω)
VIDEO LINE OUT

Fig. 7-2-1

2-1-3. Set-up of Adjutment

In this adjustment, PAL or NTSC pattern generator is connected with LINE input signal terminal. When check to tuner, connected AERIAL terminal. Check that the amplitudes of video signal SYNC signal, of picture portions, and of burst signals are flat at approximately 0.3, 0.7 and 0.3 V, respectively, and that the level ratio of the burst signal and "red" signal are 0.30: 0.66. Fig. 7-2-2. shows video signals (color bars) used in adjusting the video section.

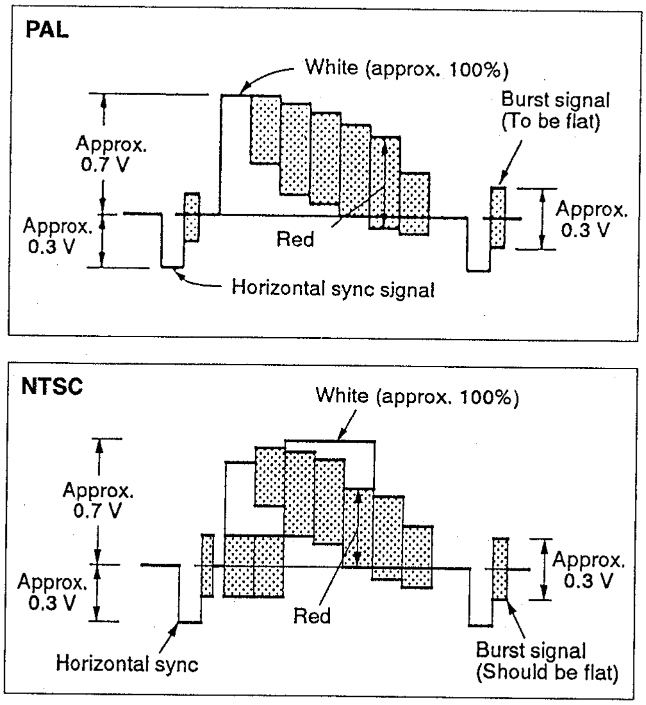

PAL
White (approx. 100%)
Burst signal (To be flat)
Approx. 0.7 V
Approx. 0.3 V
Red
Approx. 0.3 V
Horizontal sync signal
NTSC
White (approx. 100%)
Approx. 0.7 V
Approx. 0.3 V
Red
Approx. 0.3 V
Horizontal sync
Burst signal (Should be flat)

Fig. 7-2-2.

2-1-4. Alignment Tape

[PAL Alignment Tape (MH-2)]

	Time	Video signal	Audio signal
1	10 minutes	Stair-step	6 kHz
2	5 minutes	—	3 kHz
3	10 minutes	Color bar	1 kHz
4	3 minutes	RF sweep	—

[NTSC Alignment Tape (KRV-51N2)]

	Mode	Time	Video signal	Audio signal (HiFi/Normal)
1	SP	Seven minutes	Color bar	400Hz
2		Three minutes	Monoscope	400Hz
3	EP	Seven minutes	Color bar	400Hz
4		Three minutes	Monoscope	—

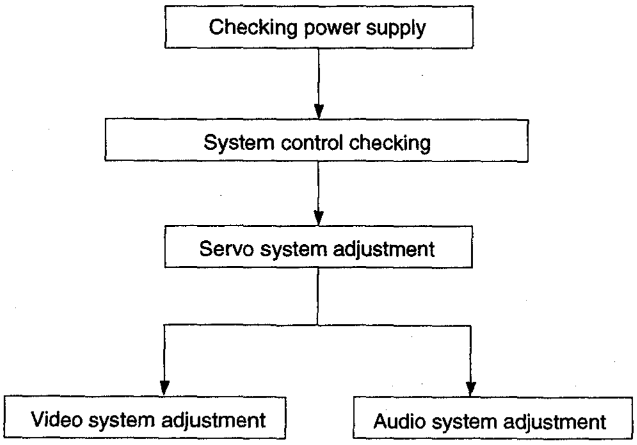
2-1-5. Specified I/O Level and Impedance

Input/output terminal

Video inputs	LINE IN : phono jack 1 Vp-p, 75Ω, unbalanced, sync negative
Audio inputs	LINE IN : phono jacks 47 kΩ, –7.5 dBs (0 dBs = 0.775 Vrms) More than 10 kΩ+, –4 dBs
Video outputs	LINE OUT : phono jack 1 Vp-p, 75Ω, unbalanced, sync negative
Audio outputs	LINE OUT : phono jacks –7.5 dBs at load impedance 47kΩ Output impedance : less than 10Ω

2-1-6. Adjusting Sequence

Make the electrical adjustment in the following sequence.



2-2. POWER SUPPLY CHECK (PS-357/368 BOARD)

Mode	E-E
Measuring Instrument	Digital voltmeter
+F, –F check	
Measurement Point	Pin ④ (+), ①(–) of CN101
Specified Value	4.3±1Vdc
–30V check	
Measurement Point	Pin ② of , CN101
Specified Value	-30±3Vdc
–8V check	
Measurement Point	Pin ⑤ of CN101
Specified Value	13.5±2Vdc
D6V check	
Measurement Point	Pin ⑥ of CN101
Specified Value	5.9±0.5V
SW12V	
Measurement Point	Pin ⑧ of CN101
Specified Value	12±1Vdc
MTR12V check	
Measurement Point	Pin ⑫ of CN101
Specified Value	12±0.5Vdc
13 V check	
Measurement Point	Pin ⑭ of CN101
Specified Value	13±1Vdc
+38V check	
Measurement Point	Pin ⑯ of CN101
Specified Value	38.0±3Vdc
SW5 V check	
Measurement Point	Pin ⑰ of CN101
Specified Value	5 ±0.5 Vdc

Checking Method:

1) Confirm that each voltage meets its specified value.

2-3. SYSTEM CONTROL CHECK

2-3-1. Clock Check (MA-251/252)

Purpose:

Adjust to improve the clock precision. When it is out of order, errors gradually increases.

Measurement point	Pin ⑦ of IC151 : MA-251 Board Pin (83) of IC201 : MA-252 Board
Measurement Equipment	Frequency counter (Interval counter mode)
Specified Value	0.1249995±0.0000005 sec

Confirmation Method:

1) Connect to the GND from IC151 pin ⑲ through a resistor 22kΩ (1-249-489-00): MA-251 board
2) Connect Pin ㊹ of IC201 to ground. (The set goes to adjusting mode.): MA-252 Board
3) Connect the frequency counter as shown below.
4) Confirm that the oscillation frequency is the specified value.

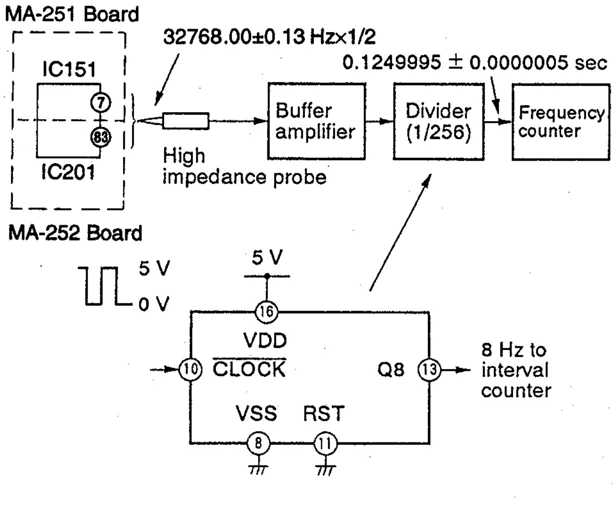

MA-251 Board
IC151
⑦
(83)
IC201
MA-252 Board
32768.00±0.13 Hz×1/2
0.1249995 ± 0.0000005 sec
High impedance probe
Buffer amplifier
Divider (1/256)
Frequency counter
5 V
0 V
5 V
⑯
VDD
⑩ CLOCK
Q8 ⑬
8 Hz to interval counter
VSS RST
⑧
⑪
MC14020B or equivalent

Fig. 7-2-3.

2-4. SERVO SYSTEM Adjustment

2-4-1. Switching Position Adjustment (MA-251/252 Board)

Purpose:

Adjust the interval between A ch and B ch of tape playback output. Improve the interchangeability with other tapes and sets.
When it is out of order, the interval appears on the screen, the screen is disturbed.

Mode	PB
Signal	Alignment tape SP mode color bar
Measurement Point	CH1: VIDEO LINE OUT CH2: Pin ③ of CN502 (RP-199/203 board) (RF SWP)
Measuring Instrument	Oscilloscope
Specified Value	6.5±0.5H (410±32μsec)

Adjusting Method:

1) Connect IC201 pin (58) to the GND for about 1 second to activate the RF switching position adjustment mode.
2) Using the channel + and – buttons, adjust to 410±32μsec (6.5±0.5H).

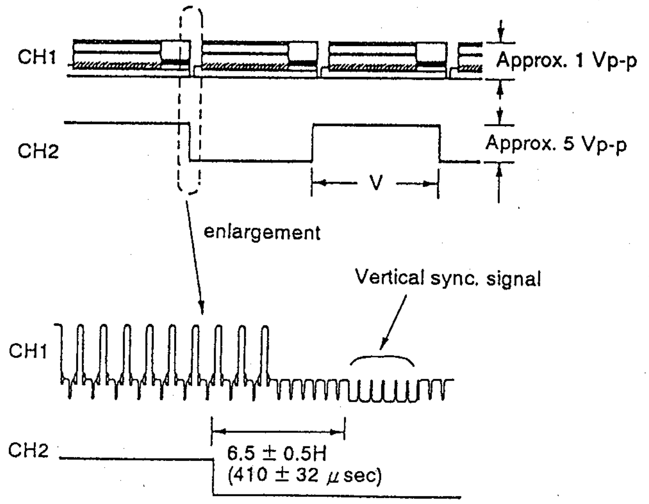

CH1
Approx. 1 Vp-p
CH2
Approx. 5 Vp-p
V
enlargement
Vertical sync. signal
CH1
CH2
6.5 ± 0.5H
(410 ± 32 μsec)

Fig. 7-2-4.

2-5. VIDEO SYSTEM ADJUSTMENT

Adjust the video system in the following sequence as a rule. The color video signal supplied from the pattern generator is used as a video input signal for video system adjustment in the recording mode. Make sure that sync. and color burst signals meet requirements specified at set up of adjustment shown in Fig. 7-2-1.

[Adjustment Sequence]

2-5-1. Recording Y Signal Level Check
2-5-2. White Clip, Dark Clip Check
2-5-3. Playback Y Signal Level Check
2-5-4. Recording Chroma Level Check
2-5-5. Sync. AGC Check
2-5-6. X'tal Oscillation Frequency Check
2-5-7. VCO Oscillation Frequency Adjustment

2-5-1. Recording Y Signal Level Check (MA-251/252 Board)

Purpose:

Check the brightness signal level after passing through the V/C separating circuit.

Mode	E-E
Signal	Color bar
Measurement point	Emitter of Q352
Measurement equipment	Oscilloscope
Specified value	900±100mVp-p

Confirmation Method:

1) Confirm that the record Y level is 900±100mVp-p.

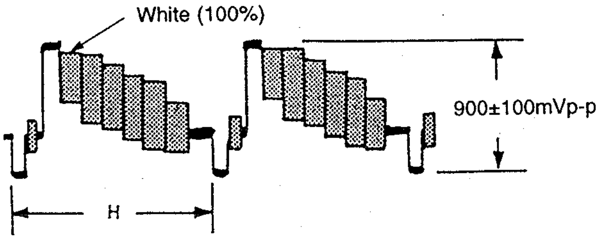


Fig. 7-2-5.

2-5-2. White Clip, Dark Clip Check (MA-251/252 Board)

Purpose:

Confirm that no overshoot is generated by the pre-emphasis circuit. If shifted, the signals are overmodulated, thus causing a noise in the images.

Mode	E-E
Signal	Color bar
Measurement point	PAL: Pin ㉜ of IC301 NTSC: Pin ㉞ of IC301
Measurement equipment	Oscilloscope
Specified value	White clip: 190±15% Dark clip: 52±10%

Confirmation Method:

1) Confirm that the white clip is 190±15%, on condition that the level between white and sync. is 100%.
2) Confirm that the dark clip is 52±10%, on condition that the level between white and sync. is 100%

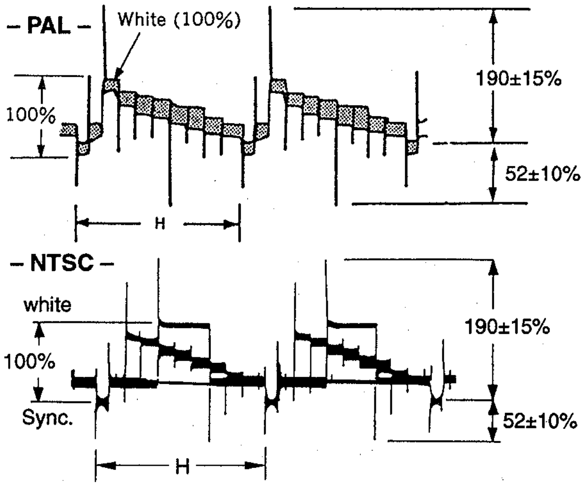


Fig. 7-2-6.

2-5-3. Playback Y Signal Level Check (MA-251/252 Board)

Purpose:

Confirm that the playback Y signal level is correct.

Mode	PB
Signal	Alignment tape SP color bar
Measurement point	VIDEO LINE OUT
Measurement equipment	Oscilloscope
Specified value	PAL: 1.98±0.18 Vp-p NTSC: 1.95±0.18 Vp-p

Note: Make this adjustment with the EDIT switch turned off. (MA-251 Board)

Confirmation Method:

1) Confirm that the play Y level are 1.98±0.18Vp-p (PAL) or 1.95±0.18Vp-p (NTSC)

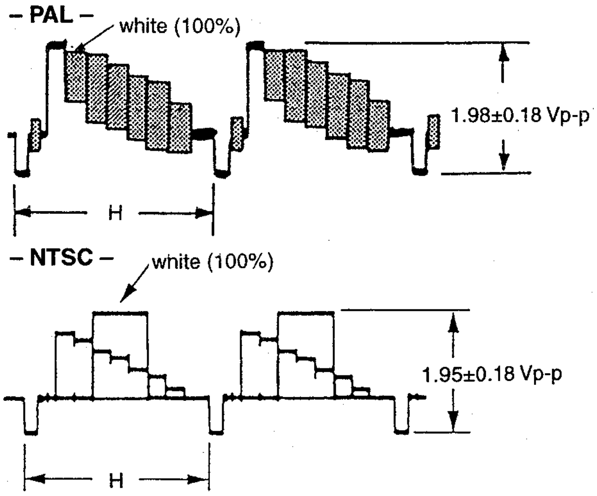


Fig. 7-2-7.

2-5-4. Recording Chroma Level Check (MA-251/252 Board)

Purpose:

Check the chroma signal level after passing through the Y/C separating circuit.

If shifted, the image is roughened and another color may appear on the edges.

Mode	E-E
Signal	Color bar
Measurement point	Pin ㉚ of IC301
Measurement equipment	Oscilloscope
Specified value	PAL SP mode: 160±23mVp-p PAL EP/LP mode: 200±37mVp-p NTSC SP mode:175±33 mVp-p NTSC EP mode: 210±39mVp-p

Connection:

Connect +5V to the Q352 emitter via a diode to cancel the REC Y signal.

Confirmation Method:

1) Confirm that the record chroma level is Specificated value.

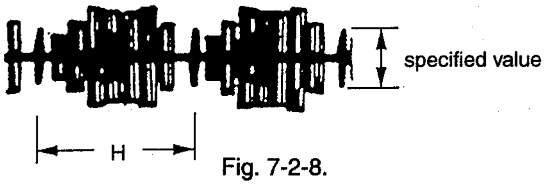


Fig. 7-2-8.

2-5-5. Sync. AGC Check (MA-251/252 Board)

Purpose:

Confirm that the video level is correct.

Mode	E-E
Signal	Color bar
Measurement point	VIDEO LINE OUT
Measurement equipment	Oscilloscope
Specified value	PAL: 2.02±0.14Vp-p NTSC: 1.98±0.14Vp-p

Note: Video output terminal must be terminated at 75Ω.

Confirmation Method:

1) Confirm that the sync. AGC level are 2.02±0.14 Vp-p (PAL) or 1.98±0.14Vp-p (NTSC).

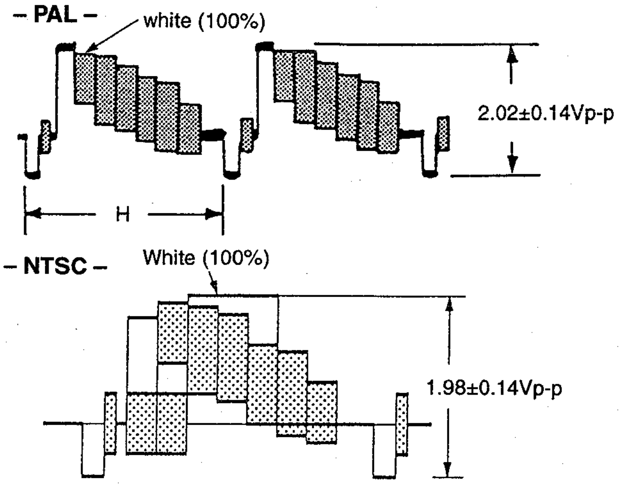


Fig. 7-2-9.

2-5-6. X'tal Oscillation Frequency Check (MA-251/252)

Purpose:

Confirm that the fsc is correct.

Mode	PB
Signal	Alignment tape SP color bar
Measurement point	Pin ㉒ of IC301
Measurement equipment	Frequency counter, Oscilloscope
Specified value	PAL: 4,433,619±96Hz NTSC: 3,579,545±82Hz

Note: connect the frequency counter through a probe of high input impedance (about 10MΩ) and low capacity (10pF or less).

Confirmation Method:

1) Confirm that the frequency are 4,433,619±96Hz (PAL) or 3,579,545±82Hz (NTSC).
2) Confirm that the amplitude are 400±200mVp-p (PAL) or 500±200mVp-p (NTSC).

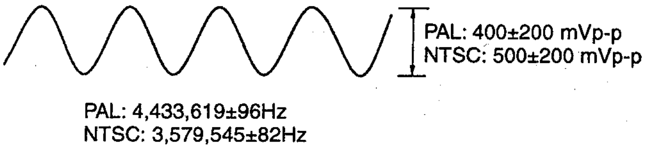


Fig. 7-2-10.

2-5-7. VCO Frequency Adjustment (MA-252 Board)

Purpose:

Adjust to set the character position on the screen.

Mode	E-E
Signal	Color bar
Measurement point	Pin ㉖ of IC401
Measuring Instrument	Oscilloscope (DC mode)
Adjusting Element	CT401
Specified value	+2.75±0.05 V

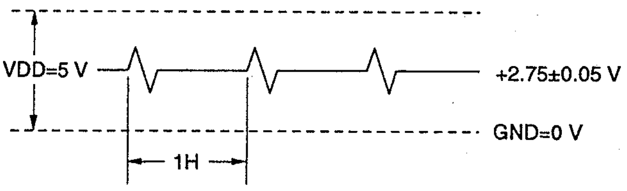


Fig. 7-2-11.

2-6. AUDIO SYSTEM ADJUSTMENTS

- Adjust both Lch and Rch.

[Connection]

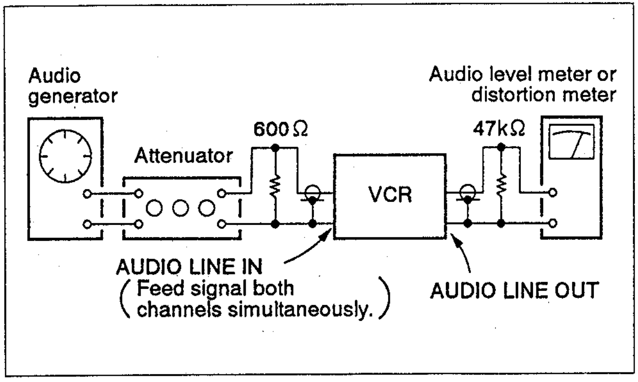

Audio generator
Audio level meter or distortion meter
600Ω
47kΩ
Attenuator
VCR
AUDIO LINE IN
(Feed signal both channels simultaneously.)
AUDIO LINE OUT

Fig. 7-2-12

2-6-1. Hi-Fi Audio System Adjustment

- Set switches and knobs to the following positions to make adjustment unless otherwise specified.
  INPUT SELECT switch .... LINE
  AUDIO MONITOR .... STEREO

[Adjusting Sequence]

1. VCO fo adjustment
2. Deviation check
3. BPF fo adjustment
4. AF switching position

1. VCO fo Adjustment (MA-251/252 Board)

Purpose:

Adjust to have interchangeability in HiFi audio.
When it is out of order, the sound is distorted.

Mode	REC
Signal	No signal
Measuring Instrument	Frequency counter
1.3 MHz Adjustment	
Measurement Point	Pin ① of CN501 Auto tracking ON (Remote commander)
Adjusting Element	RV521 (R CH)
Specified Value	1.3 MHz ± 1 kHz
1.4 MHz Adjustment	
Measurement Point	Pin ① of CN501 Auto tracking ON (Remote commander)
Adjusting Element	RV522(R CH)
Specified Value	1.4 MHz ± 1 kHz
1.7 MHz Adjustment	
Measurement Point	Pin ① of CN501 Auto tracking OFF (Remote commander)
Adjusting Element	RV531 (R CH)
Specified Value	1.7 MHz±1kHz
1.8 MHz Adjustment	
Measurement Point	Pin ① of CN501 Auto tracking ON (Remote commander)
Adjusting Element	RV532 (R CH)
Specified Value	1.8 MHz ± 1 kHz

Note: Connect the frequency counter through a probe of high input impedance (more than 1 MΩ) and low capacity (10 pF or less).

Connection:

Connect pin ② and ③ of CN881 with a jumper wire.

Adjusting Method:

1) Connect the frequency counter to pin ① of CN501.
2) Adjust each volume so that each frequency meets its specified value.

2. Deviation Check (MA-251/252 Board)

Purpose:

Set the HiFi audio signal level to specified value.
Adjust to have interchangeability with other tapes and sets.
When it is out of order, the volume of sound is different on playback.

Mode	REC
Signal	Pin ② (Lch), ① (Rch) of IC501 400Hz –7.5 dBs (920m Vp-p)
Measurement Point	pin ① of CN501 Lch: Auto tracking ON (Remote commander) Rch: Auto tracking OFF (Remote commander)
Measurement Equipment	Modulation analyzer
Specified Value	50±5kHz

Connection:

Connect pin ② and ③ of CN881 with a jumper wire.

3. BPF fo Adjustment (MA-251/252 Board)

Purpose:

Adjust to separate carrier component precisely and to operate normally the filter for cutting video signal.
When it is out of order, the sound is distorted.

Mode	PB
Signal	1.608 MHz Input 200 mVp-p: Pin ③ of CN501
Measurement point	Pin ① of CN501
Measuring Instrument	Oscilloscope
Adjusting Element	RV541

Note: Talk a trigger from AF SWP (Pin ⑥ of CN501).

Connection:

1) Feed 1.608 MHz, 200 mVp-p sine wave to Pin ③ of CN503.

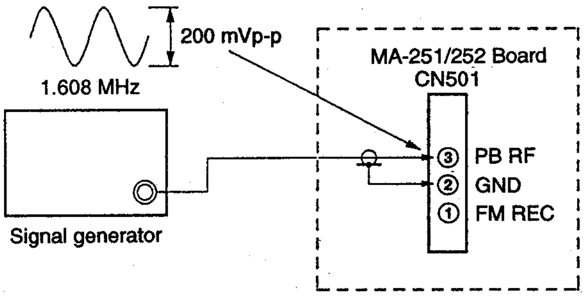
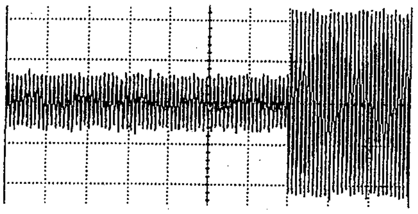


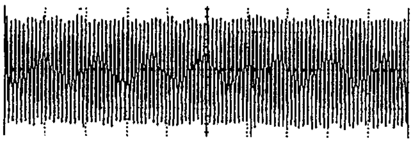
Fig. 7-2-13.

Adjusting method:

1) In the play mode, turn off the auto tracking from the remote controller.
2) Adjust RV541 so that the amplitudes of A and B are on the same level (±2mVp-p).



Disordered condition



Adjusted condition

Fig. 7-2-14

4. AF Switching Position Adjustment (MA-251/252 Board)

Purpose:

Adjust the interval between A CH and B CH of tape playback output. Improve the interchangeability with other tapes and sets.
When it is out of order, noisy sound is increased and big noise is heard.

Mode	PB
Signal	Alignment tape SP mode color bar
Measurement point	CH1: Pin ③ of CN502 (RP-199/203 Board) CH2: Pin ① of CN707 (RP-199/203 Board)
Measuring Instrument	Oscilloscope
Specified Value	Fig. 7-2-15

Adjusting method:

1) Connect IC201 pin (58) to the GND for about 1 second to activate the RF switching position adjustment mode.
2) Press the record button to activate the AF switching position adjustment mode.
3) Using the channels + and – buttons, minimize a chipped portion. At this time, confirm that a noisy sound is not heard.

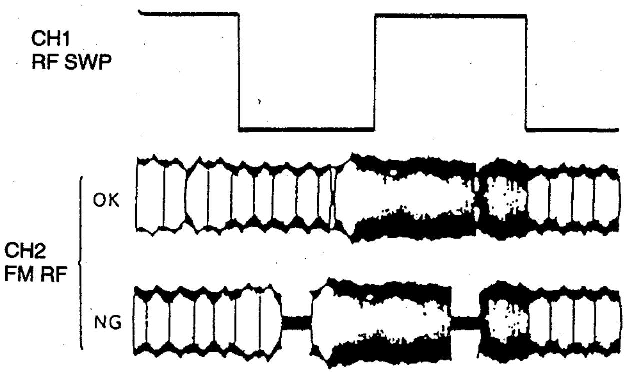


Fig. 7-2-15.

2-6-2. Normal Audio System Adjustment

- Make adjustment in the SP mode, unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

[Adjustment Sequence]

1. **ACE Head Adjustment**
2. **E-E Output Level Check**
3. **Recording Bias Adjustment**
4. **Overall Level Characteristic and Distortion Factor Check**
5. **Overall S/N Check**

1. ACE Head Adjustment

Refer to the service manual of VHS MECHANICAL ADJUSTMENT IV.

2. E-E Output Level Check

Purpose:

Confirm that the output level against the reference input is within the specification.

Mode	E-E
Signal	L, R: 400Hz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	–7.5±2dBs

Confirmation Method:

1) Simultaneously input a signal of 400Hz, –7.5dBs to both L and R channels of Audio Line Input.
2) Confirm that the audio output level is –7.5±2dBs.

3. Recording Bias Check (MA-251/252 Board)

Purpose:

Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP mode)
Signal	400Hz, –27.5 dBs 7kHz, –27.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	0±3dB

Note: Tape path adjustment must have been completed.

Confirmation Method:

1) Supply a signal of 400 Hz, -27.5 dBs to both L and R channels of Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate –27.5 dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7 kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
7) Confirm that the 7 kHz playback output level within a range of the 400 Hz playback output level 0±1 dB.

4. Overall Level Characteristic and Distortion Factor Check

Purpose:

Check the record level, play level, and distortion factor against the reference input.

Mode	REC and PB (SP mode)
Signal	400Hz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter and distortion factor meter
Specified value	Playback level: –7.5±3dBs Distortion factor: 4% or less

Confirmation Method:

1) Supply an audio signal of 400Hz, –7.5 dBs simultaneously to both L and R channels of Audio Line Input.
2) Make recording
3) Play back a recorded portion.
4) Confirm that a playback level is –7.5±3dBs.
5) Confirm that a distortion factor is within 4%.

5. Overall S/N Check

Purpose:

Confirm that the S/N is within the specification.

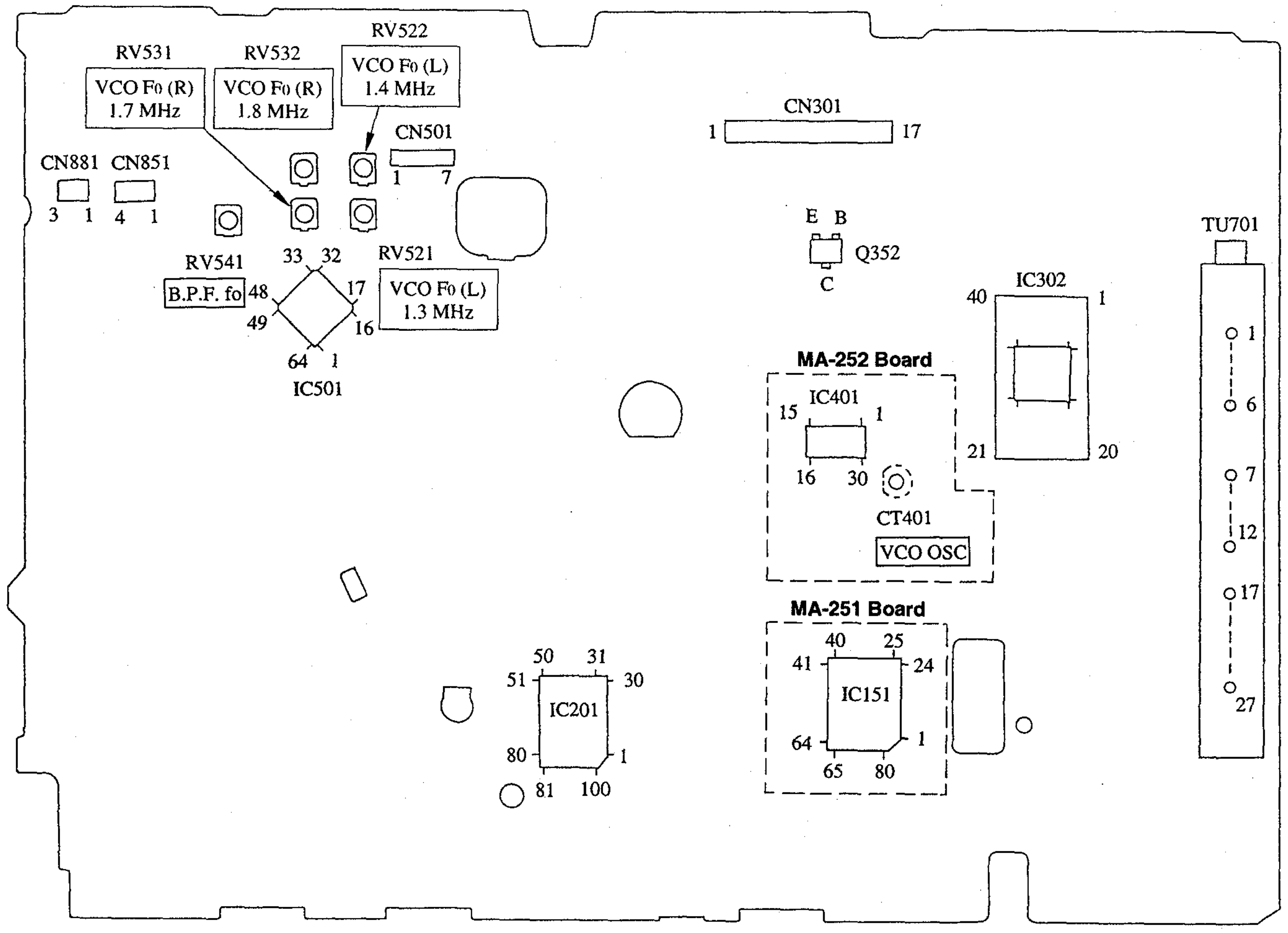
Mode	REC and PB (SP mode)
Signal	No signal
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	–46dB or more

Confirmation Method:

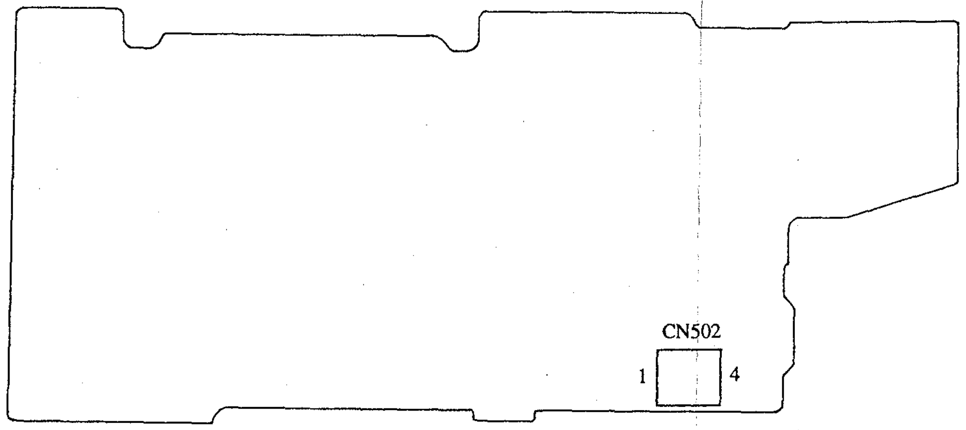
1) Connect both L and R channels of audio line input to the GND.
2) Start recording.
3) Play the recorded part to confirm that the noise is below –46dB.

2-7. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENTS

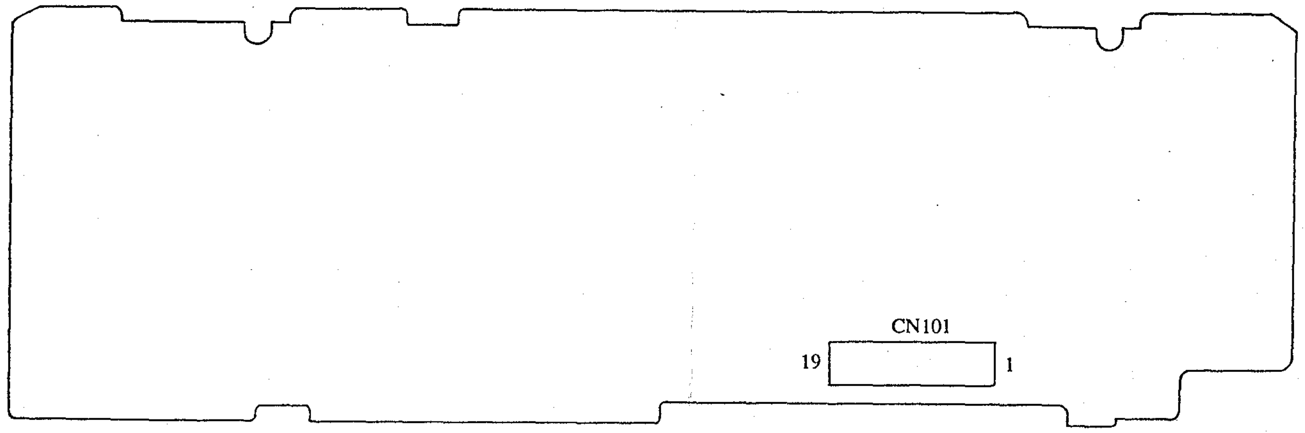
MA-251/252 BOARD (CONDUCTOR SIDE)


RV531
VCO F0 (R) 1.7 MHz
RV532
VCO F0 (R) 1.8 MHz
RV522
VCO F0 (L) 1.4 MHz
CN501
1 7
CN881 CN851
3 1 4 1
RV541
B.P.F. fo
33 32
48
49
17
16
64 1
IC501
RV521
VCO F0 (L) 1.3 MHz
CN301
1 17
E B
Q352
C
IC302
40 1
21 20
TU701
1
6
7
12
17
27
MA-252 Board
IC401
15 1
16 30
CT401
VCO OSC
MA-251 Board
40 25
41 24
IC151
64 1
65 80
50 31
51 30
IC201
80 1
81 100

RP-199/203 BOARD (COMPONENT SIDE)



PS-357/368 BOARD (COMPONENT SIDE)



SLV-X715ME/X715PS/X715SG/X815ME/X815PS/X815SG/X825AS/X825MI/X825MN/X825MNB/X835AS/X835ME/X835MN

RMT-V181L/V181M/V181N/V185

SONY®

SERVICE MANUAL

ME Model

SLV-X715ME/X715SG/X815ME/X815SG/
X825MN/X835ME/X835MN

E Model

SLV-715PS/X815PS/X825MNB

Australian Model

SLV-X825AS/X835AS

South Africa Model

SLV-X825MI

SUPPLEMENT-1

File this supplement with the service manual.

Subject :

1. **Input data of EEP ROM addition (SLV-X825/X835)**
2. **Printed wiring boards correct**
3. **Printed wiring boards changed (SLV-X715/X815)**
4. **Mechanism chassis assembly changed**
5. **Electrical parts list add**

(SLP-610037)

TABLE OF CONTENTS

Section Title Page

1. INPUT DATA OF EEP ROM ADDITION (SLV-X825/X835) 1

2. PRINTED WIRING BOARDS CORRECTION 4

3. PRINTED WIRING BOARDS CHANGED 6
3-1. Single Sided MA Board 6
MA-278 Printed Wiring Board 6
MA-278 Schematic Diagram 9

4. MECHANISM CHASSIS ASSEMBLY CHANGED 11
4-1. Mechanism Chassis Assembly (1) 11
4-2. Hard Ware List 11
4-3. Mechanism Chassis Assembly (2) 12
4-4. Mechanism Chassis Assembly (3) 13
4-5. Mechanism Chassis Assembly (4) 13

5. ELECTRICAL PARTS LIST (SLV-X715/X815) 14

1. INPUT DATA OF EEP ROM ADDITION (SLV-X825/X835)

- When replacing EEP ROM (IC153) on MA251 board, it is necessary to set the data on page F as follows ;
- Before changing the data on page F, change the data on page 1 address 00 from 00 to 80.

F PAGE MEMORY MAP

Address	SLV-X825AS	SLV-X825MI	X825MN/MNB	X835AS	X835ME/MN
01	08	08	08	08	08
02	00	01	02	03	04

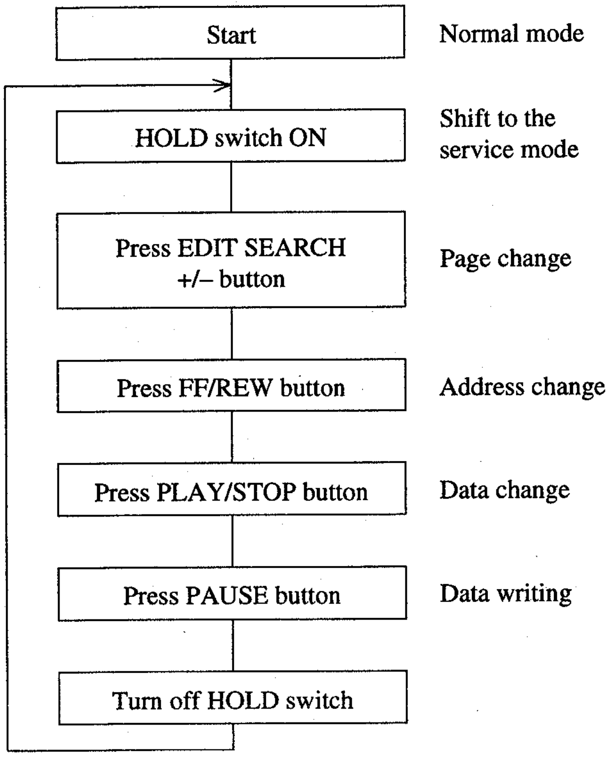
- See next page about the input method of data.

<SERVICE MODE>

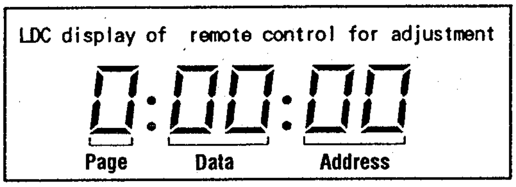
SETTING THE SERVICE MODE

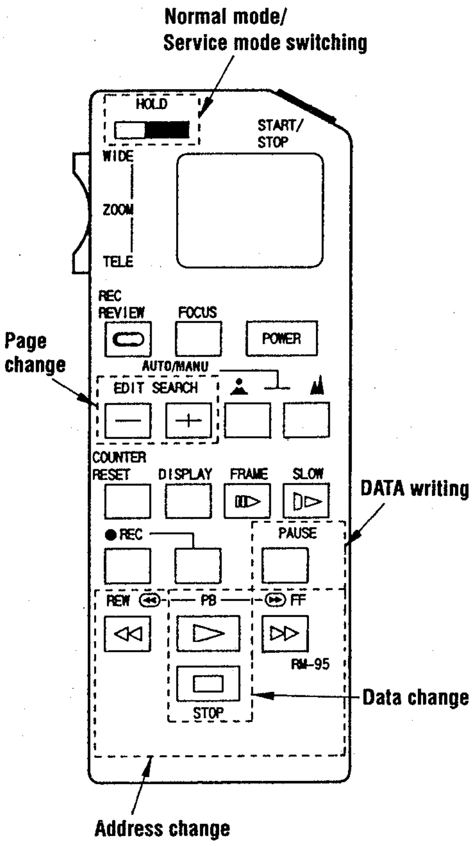
The service mode consists of the adjustment mode which adjusts the EVR and the test mode which shows the condition of the unit. The unit can be set into the mode and adjustment mode by connecting the adjusting remote commander (Set the HOLD switch to 'HOLD').

(1) Shifting to the service mode using the adjusting remote commander.


Start
Normal mode
HOLD switch ON
Shift to the service mode
Press EDIT SEARCH +/– button
Page change
Press FF/REW button
Address change
Press PLAY/STOP button
Data change
Press PAUSE button
Data writing
Turn off HOLD switch

Adjusting remote command RM-95 (J-6082-053-B)

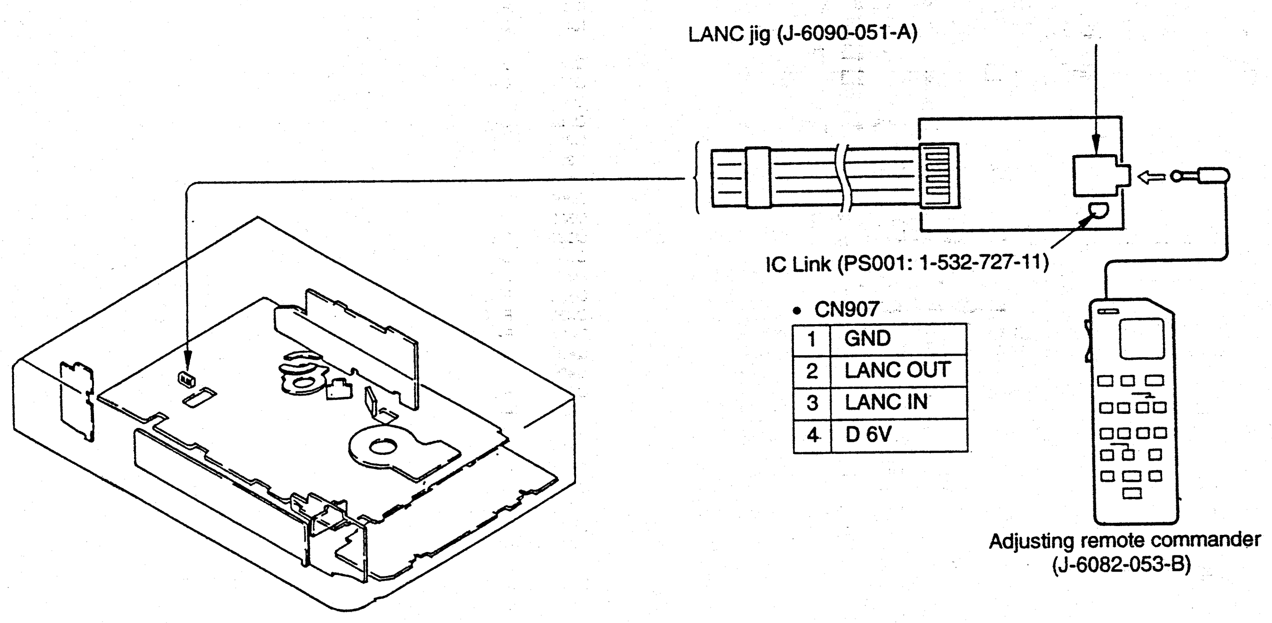

LDC display of remote control for adjustment
0:00:00
Page
Data
Address


Normal mode/
Service mode switching
HOLD
START/
STOP
WIDE
ZOOM
TELE
REC
REVIEW
FOCUS
POWER
Page
change
AUTO/MANU
EDIT SEARCH
COUNTER
RESET
DISPLAY
FRAME
SLOW
DATA writing
●REC
PAUSE
REW
PB
FF
RM-95
STOP
Data change
Address change

Command mode	Command function	Normal LANC Command
Page Up	Page +1	Edit Search +
Page Down	Page –1	Edit Search –
Address Up	Address +1	Fast Forward
Address Down	Address –1	Rewind
Data Up	Data +1	Play Back
Data Down	Data –1	Stop
Store	Writes data in the EEPROM	Pause

(2) Adjusting remote commander connecting procedure.
SLV-X825/X835 series does not have the LANC jack for LANC adjusting remote commander.
When adjusting, connect the LANC jig (J-6090-051-A) to CN907 on MA-251 board.

> **Note** : When connecting or disconnecting LANC jig to CN907 on MA-251 board, first connect the adjusting remote commander to the jack on LANC jig before connecting LANC jig to CN907.
> Connection or disconnection of the adjusting remote commander in the condition LANC jig is connected to CN907 causes IC link to damage itself.


LANC jig (J-6090-051-A)
IC Link (PS001: 1-532-727-11)
Adjusting remote commander
(J-6082-053-B)

- CN907

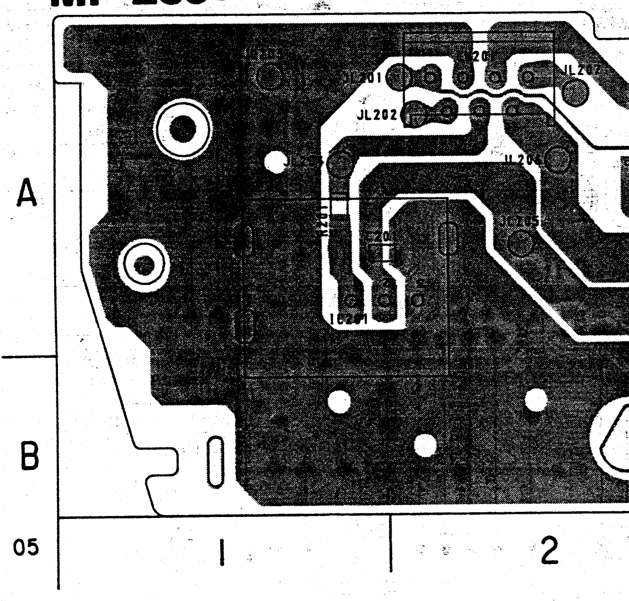
1	GND
2	LANC OUT
3	LANC IN
4	D 6V

2. PRINTED WIRING BOARDS CORREC

- The pattern drawings were confused between MF-285 bo

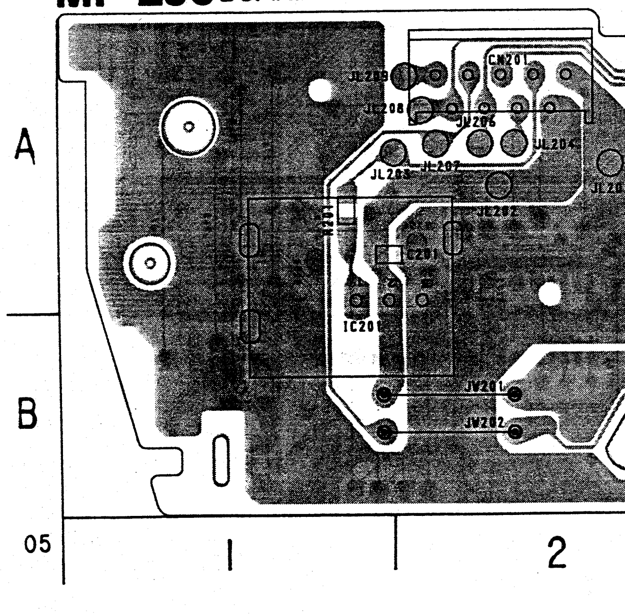
Service manual page 4-40

MF-285 BOARD


JL201
JL202
JL207
A
B
05
1
2

Service manual page 4-44

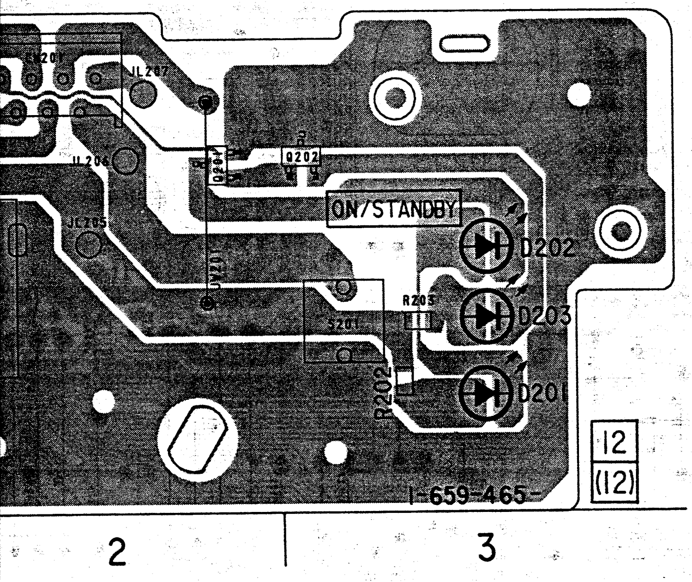
MF-290 BOARD

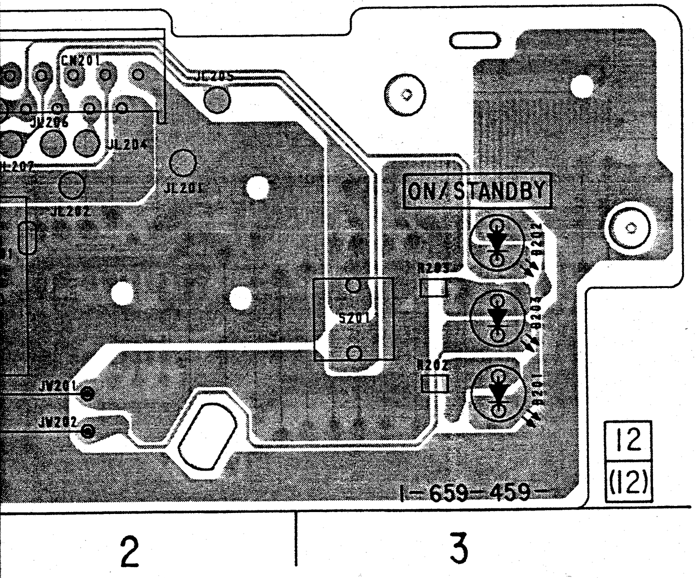

CN201
JL208
JL206
JL204
JL203
JL202
IC201
JW201
JW202
A
B
05
1
2

Suppl 1

DS CORRECT

etween MF-285 board and MF-290 board, and therefore they are corrected.


JL207
JL204
JL205
D202
ON/STANDBY
D202
D203
D201
R203
R202
S201
1-659-465
12
(12)
2
3


CN201
JL205
JL206
JL204
JL201
JL202
ON/STANDBY
R203
R202
S201
JW201
JW202
1-659-459
12
(12)
2
3

3. PRINTED WIRING BOARDS CHANGED

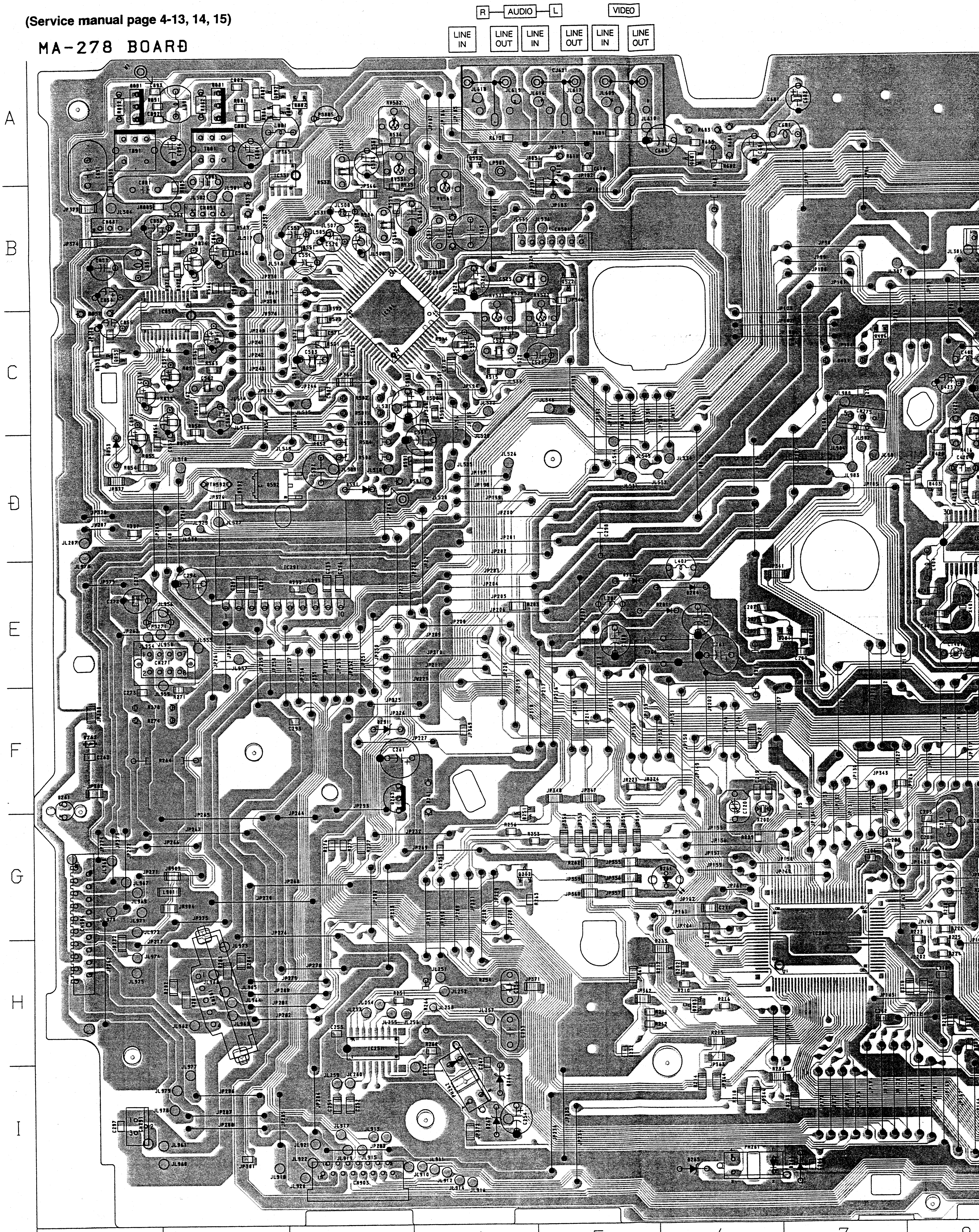
3-1. SINGLE SIDED MA BOARD (SLV-X715/X815)

- The both sided MA-252 board was changed to single sided MA-278 board.

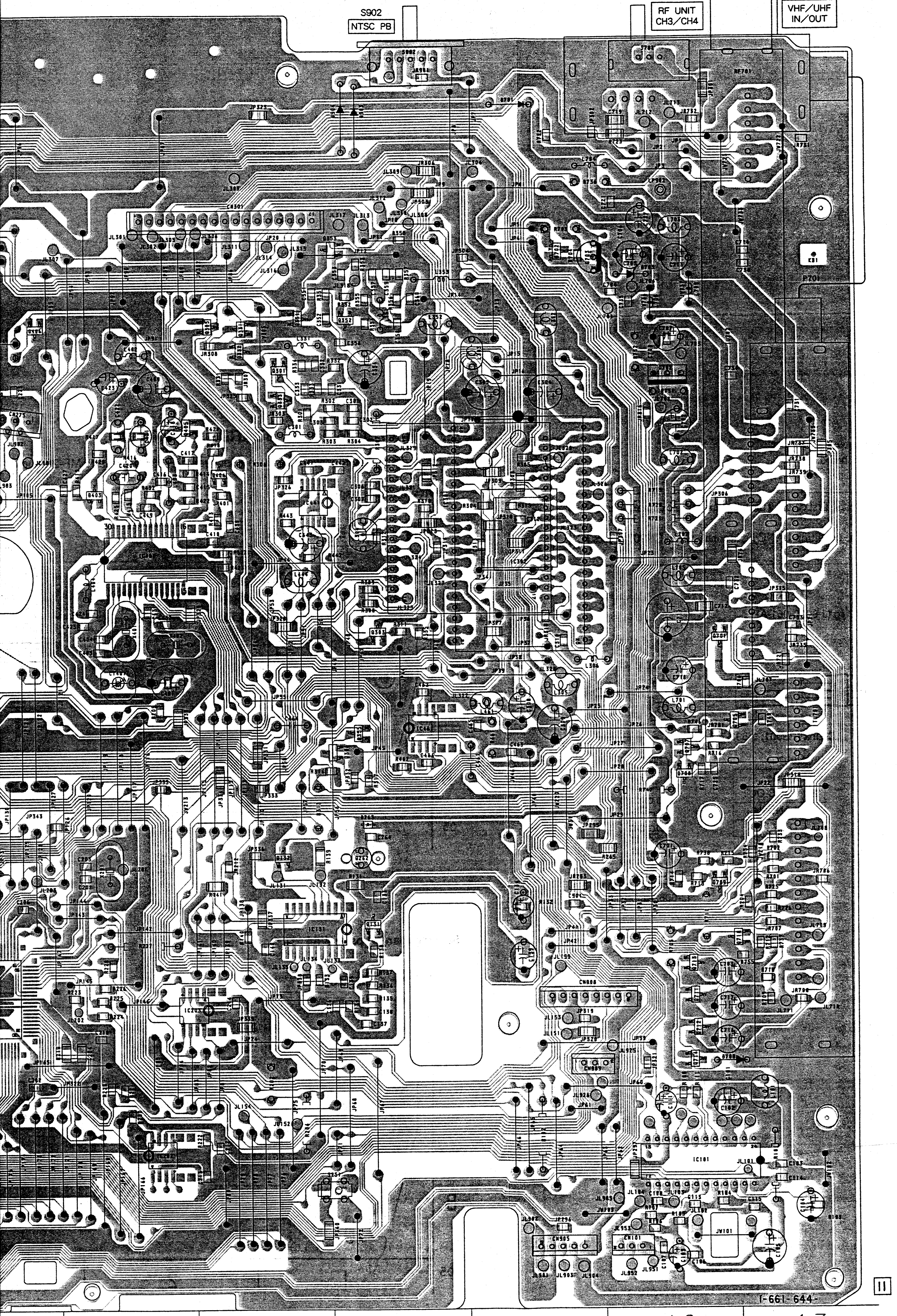
MA-278 (SERVO/SYSTEM CONTROL, VIDEO, AUDIO, IO, TUNER) (SLV-X715/X815) PRINTED WIRING BOARD
– Ref. No.: MA-278 Board; 4,000 series –

There are cases that the part isn't mounted in th

(Service manual page 4-13, 14, 15)


R
AUDIO
L
VIDEO
LINE IN
LINE OUT
LINE IN
LINE OUT
LINE IN
LINE OUT
MA-278 BOARD
A
B
C
D
E
F
G
H
I
05
1
2
3
4
5
6
7
8

the part isn't mounted in this model is printed on this diagram.



MA-278 BOARD

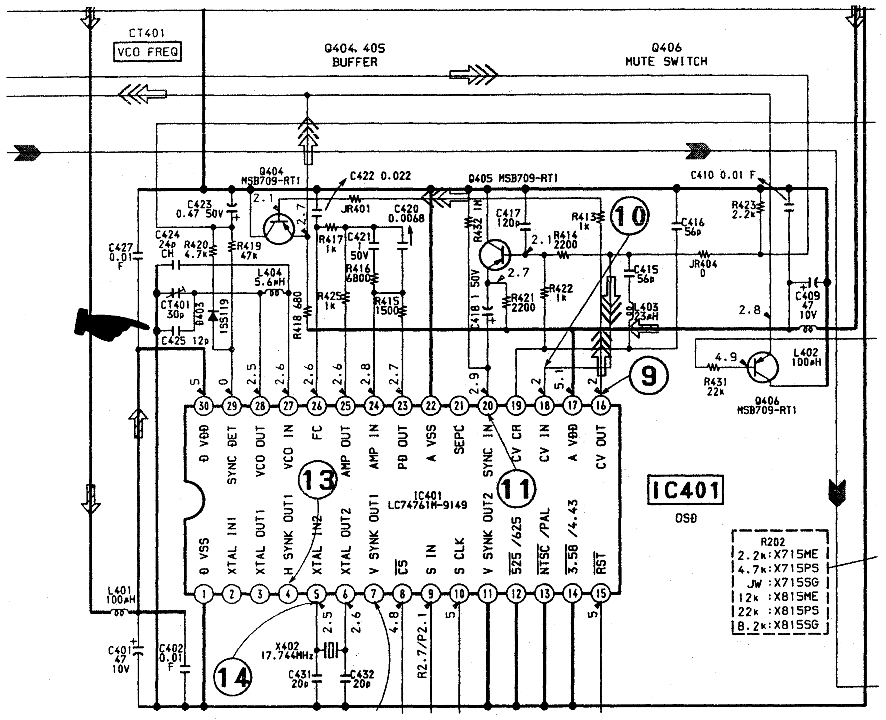
CN101	I-12
CN271	E-2
CN275	C-7
CN281	H-2
CN291	I-1
CN301	B-8
CN501	B-5
CN851	B-2
CN881	B-1
CN903	I-3
CN905	I-11
CN906	G-1
CN908	H-11
D201	E-5
D202	H-6
D203	H-6
D204	E-6
D251	G-4
D261	G-6
D265	I-6
D267	I-4
D291	F-3
D403	D-8
D591	D-3
D610	B-5
D701	A-11
D702	B-11
D703	B-12
D708	H-12
D853	D-1
D902	E-5
D903	A-10
D904	A-10
IC101	I-12
IC201	G-7
IC202	I-8
IC203	H-8
IC251	H-3
IC291	E-2
IC301	D-11
IC401	D-8
IC441	D-9
IC461	F-10
IC501	C-3
IC551	A-3
IC851	C-2
Q201	E-1
Q202	G-4
Q261	F-1
Q262	G-10
Q263	F-3
Q301	C-9
Q303	E-10
Q305	C-9
Q332	C-9
Q333	C-9
Q351	C-9
Q352	C-10
Q353	B-10
Q355	F-10
Q404	E-8
Q405	C-8
Q406	C-7
Q522	B-5
Q532	A-4
Q591	D-4
Q592	D-2
Q681	A-6
Q703	B-11
Q710	G-12
Q711	H-12
Q712	H-12
Q713	G-12
Q714	H-12
Q853	C-1
Q881	A-2
Q882	A-3
Q886	A-3
Q891	A-1
Q892	A-2

MA-278 SCHEMATIC DIAGRAM

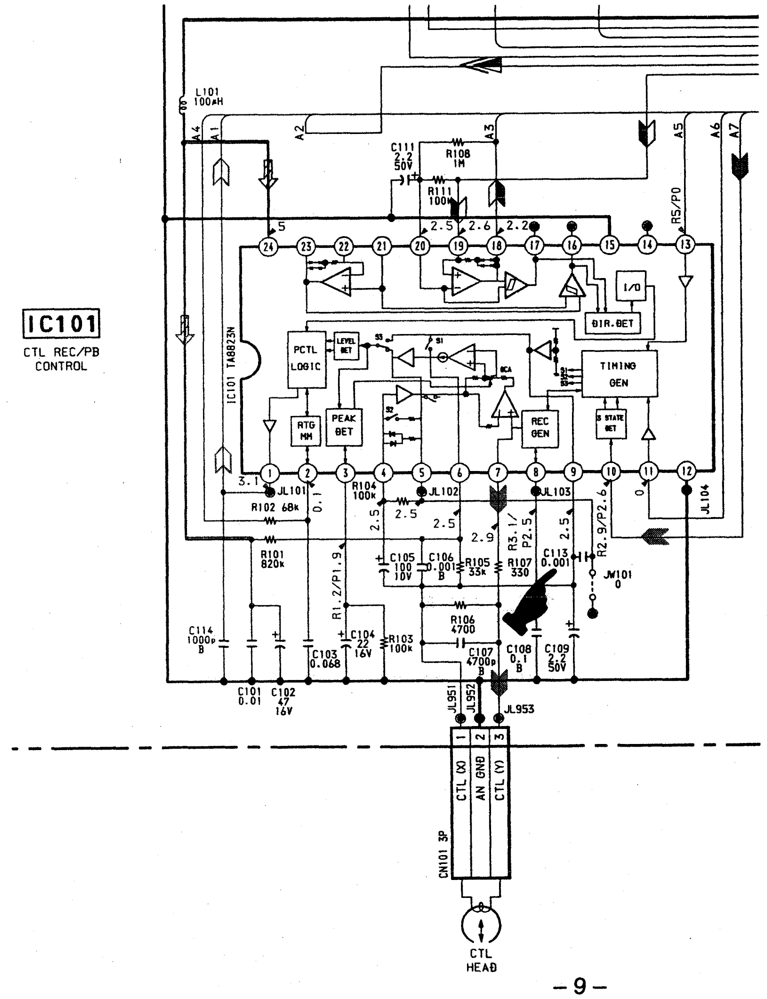
– Ref. No.: MA-278 Board; 4,000 series –

: Modificated portion

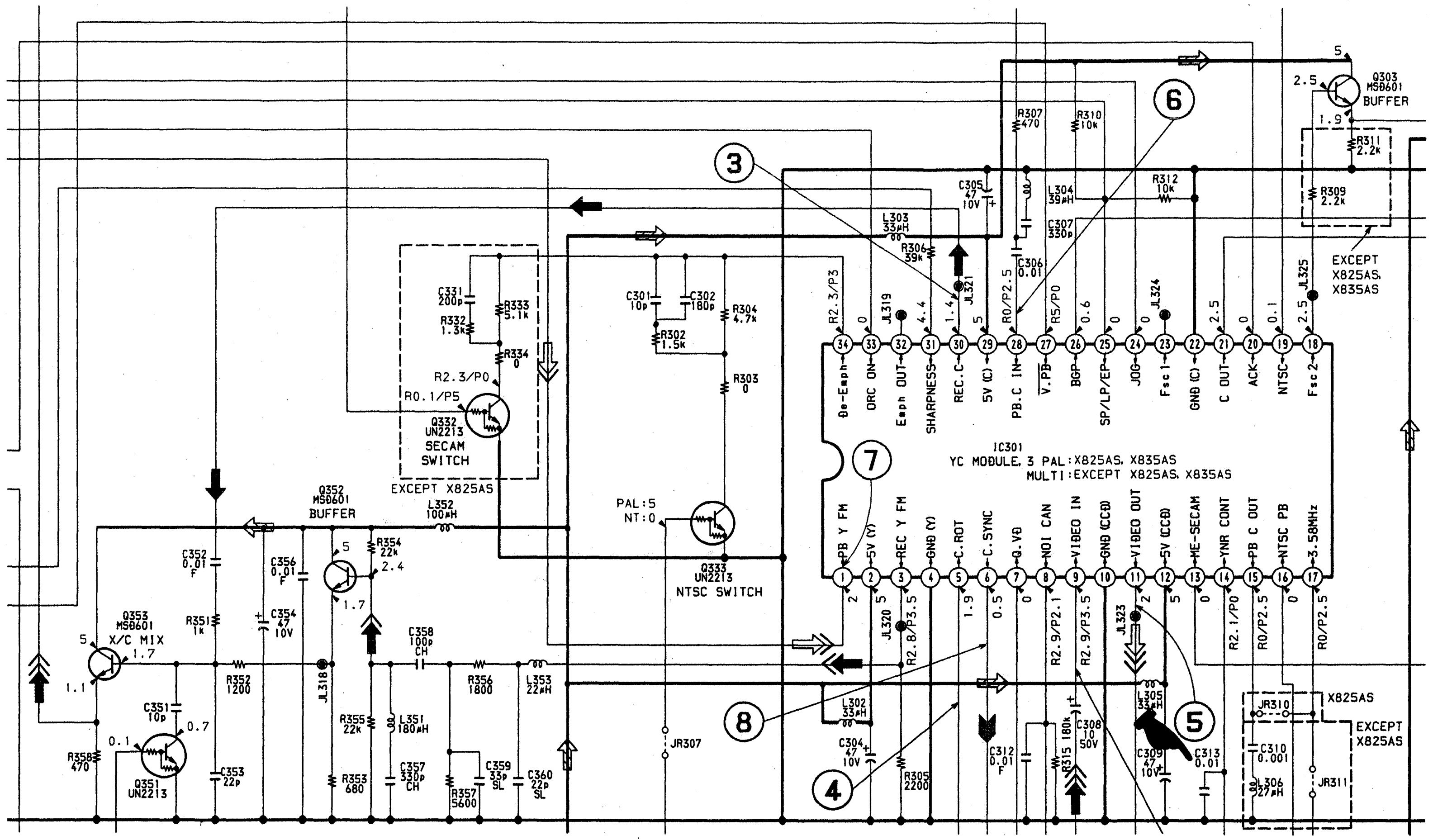
MA-278 BOARD (2/4) (SERVO/SYSTEM CONTROL)
(Service manual page 4-25 Location C-G, 7-12)


CT401
VCO FREQ
Q404, 405 BUFFER
Q406 MUTE SWITCH
Q404 MSB709-RT1
Q405 MSB709-RT1
Q406 MSB709-RT1
IC401 LC7476IM-9149
IC401 OSD
X402 17.744MHz
R202
2.2k : X715ME
4.7k : X715PS
JW : X715SG
12k : X815ME
22k : X815PS
8.2k : X815SG
L401 100μH
L402 100μH
L404 5.6μH
L403 33μH
0 VDD
SYNC DET
VCO OUT
VCO IN
FC
AMP OUT
AMP IN
PB OUT
A VSS
SEPC
SYNC IN
CV CR
CV IN
A VDD
CV OUT
0 VSS
XTAL IN1
XTAL OUT1
H SYNC OUT1
XTAL IN2
XTAL OUT2
V SYNC OUT1
CS
S IN
S CLK
V SYNC OUT2
525/625
NTSC/PAL
3.58/4.43
RST
9
10
11
13
14

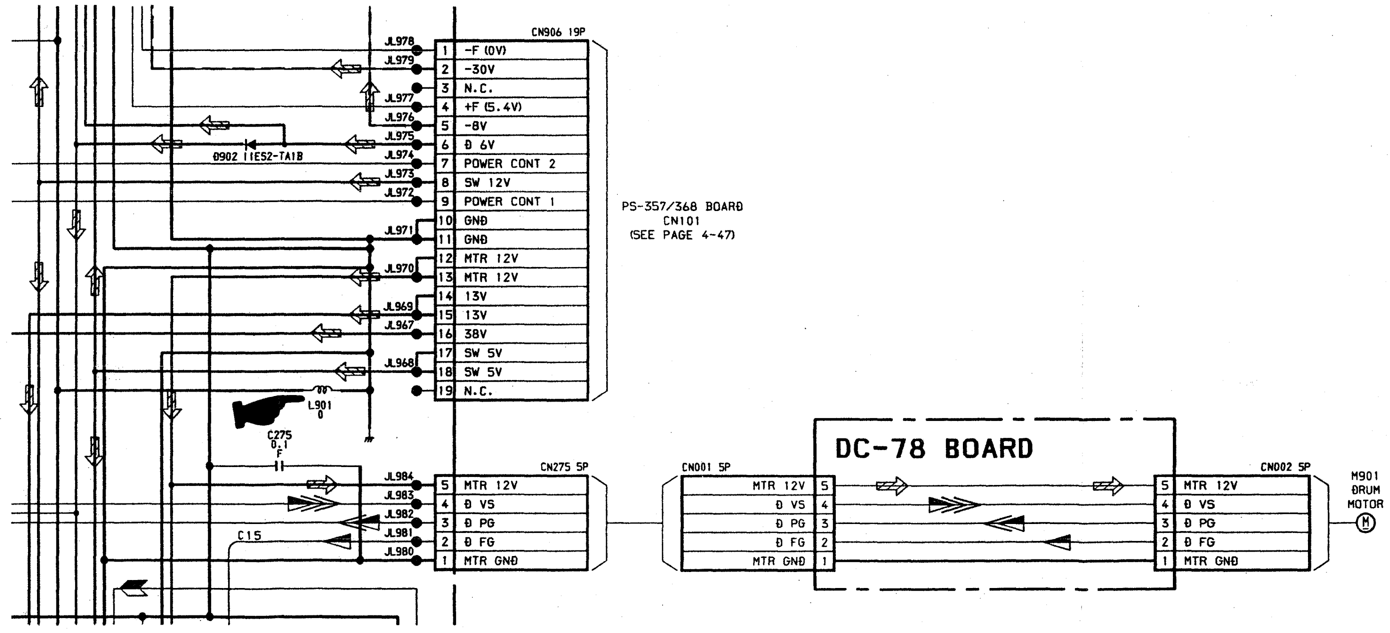
MA-278 BOARD (2/4) (SERVO/SYSTEM CONTROL)
(Service manual page 4-25, 26 Location L-R, 12-16)


IC101
CTL REC/PB CONTROL
IC101 TA8823N
L101 100μH
PCTL LOGIC
LEVEL DET
TIMING GEN
DIR.DET
I/O
RTG MM
PEAK DET
REC GEN
3 STATE DET
R101 820k
R102 68k
R104 100k
R106 4700
R107 330
R108 1M
R111 100k
C101 0.01
C102 47 16V
C103 0.068
C114 1000p
JL101
JL102
JL103
JL104
JW101
JL951
JL952
JL953
CN101 3P
CTL (X)
AN GND
CTL (Y)
CTL HEAD
A1
A2
A3
A4
A5
A6
A7
R5/P0
R1.2/P1.9
R3.1/P2.5
R2.9/P2.6

MA-278 BOARD (1/4) (VIDEO)
(Service manual page 16, 17 Location C-H, 6-14)


Q303 MSB601 BUFFER
Q332 UN2213 SECAM SWITCH
EXCEPT X825AS
Q333 UN2213 NTSC SWITCH
PAL:5
NT:0
Q352 MSB601 BUFFER
Q353 MSB601 X/C MIX
Q351 UN2213
IC301
YC MODULE, 3 PAL:X825AS, X835AS
MULTI:EXCEPT X825AS, X835AS
EXCEPT X825AS, X835AS
X825AS
EXCEPT X825AS
De-Emph
ORC ON
Emph OUT
SHARPNESS
REC.C
SV (C)
PB.C IN
V.PB
BGP
SP/LP/EP
JOG
Fsc 1
GND (C)
C OUT
ACK
NTSC
Fsc 2
PB Y FM
5V (Y)
REC Y FM
GND (Y)
C.ROT
C.SYNC
Q.VD
NOI CAN
VIDEO IN
GND (CCD)
VIDEO OUT
5V (CCD)
ME-SECAM
YNR CONT
PB C OUT
NTSC PB
3.58MHz
JR307
JR310
JR311
3
4
5
6
7
8

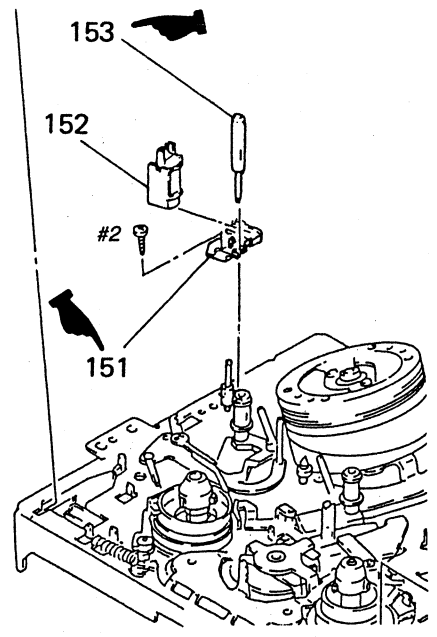
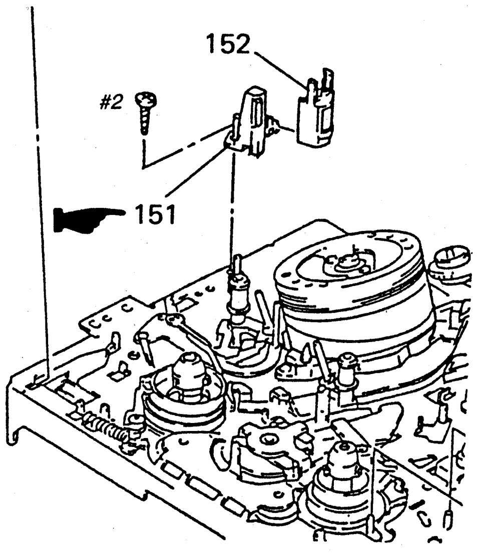
MA-278 BOARD (2/4) (SERVO/SYSTEM CONTROL)
(Service manual page 4-27, 28 Location H-K, 24-33)


CN906 19P
1 -F (0V)
2 -30V
3 N.C.
4 +F (5.4V)
5 -8V
6 D 6V
7 POWER CONT 2
8 SW 12V
9 POWER CONT 1
10 GND
11 GND
12 MTR 12V
13 MTR 12V
14 13V
15 13V
16 38V
17 SW 5V
18 SW 5V
19 N.C.
D902 11ES2-TA1B
PS-357/368 BOARD CN101 (SEE PAGE 4-47)
L901 0
C275 0.1 F
CN275 5P
5 MTR 12V
4 D VS
3 D PG
2 D FG
1 MTR GND
DC-78 BOARD
CN001 5P
CN002 5P
M901 DRUM MOTOR
C15

4. MECHANISM CHASSIS ASSEMBLY CHANGED

4-1. MECHANISM CHASSIS ASSEMBLY (1) (See page 5-7)

☞ : Modificated portion

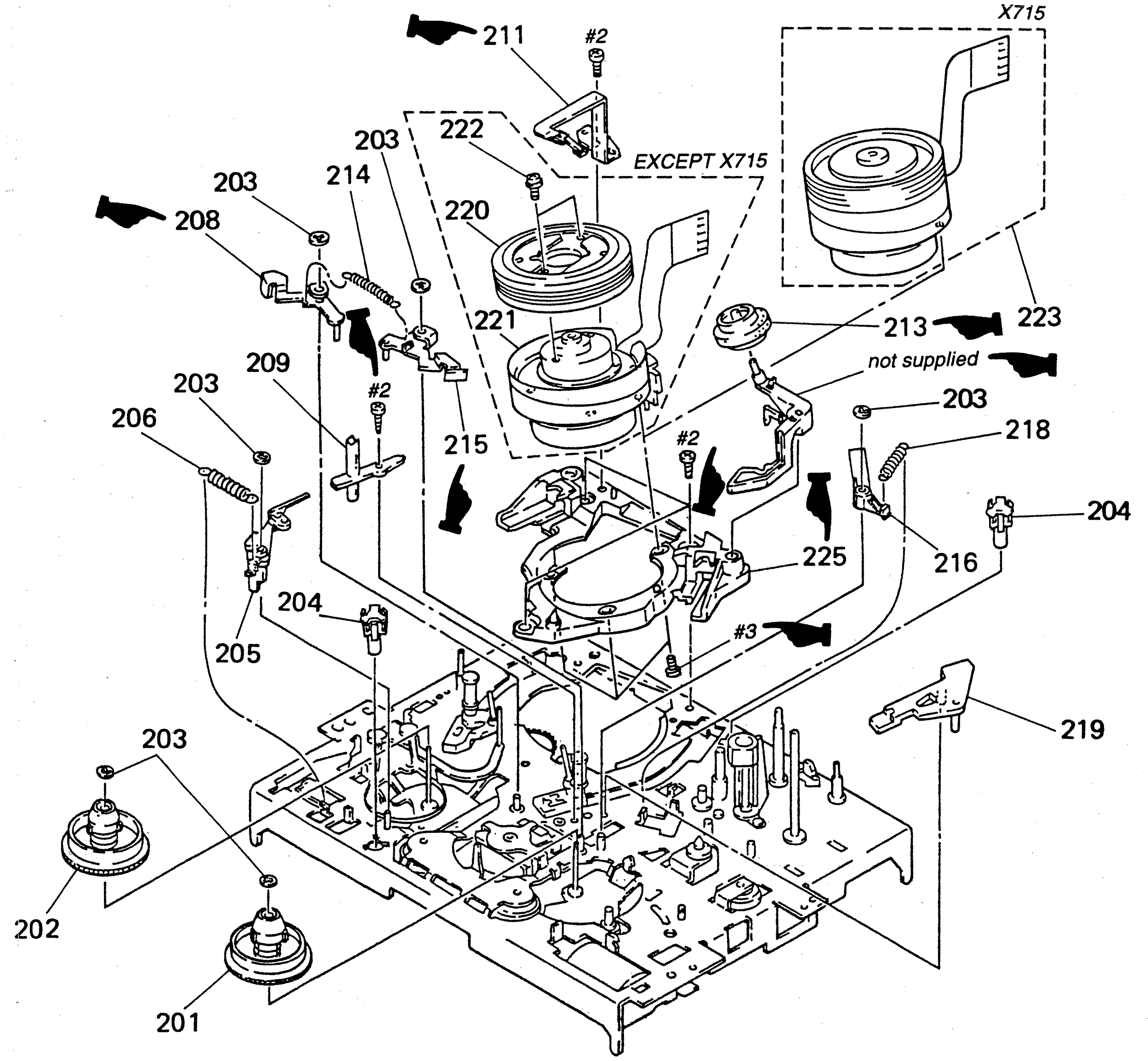
Former Type			New Type		
 153 152 #2 151					
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
151	X-3945-348-1	FEH ASSY	151	X-3945-348-2	FEH ASSY
153	X-3944-460-1	ROLLER ASSY, TG2			

4-2. HARDWARE LIST (See page 5-31)

Former Type			New Type		
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
#7	7-621-772-08	SCREW +B 2 x 3			

4-3. MECHANISM CHASSIS ASSEMBLY (2) (See page 5-8)

☞ : Modificated portion


211
#2
X715
222
203
EXCEPT X715
203
214
208
220
203
221
213
223
not supplied
209
#2
203
203
215
218
206
#2
204
225
216
204
205
#3
219
203
202
201

Former Type			New Type		
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
207	3-961-441-01	SCREW (3 x 8)			
208	X-3945-650-1	BRAKE (S) ASSY, MAIN	208	X-3945-443-1	BRAKE (S) ASSY, MAIN
210	3-958-389-01	CATCHER			
211	X-3943-899-5	GROUND ASSY, SHAFT	211	X-3943-899-7	GROUND ASSY, SHAFT
212	3-321-393-01	WASHER, STOPPER			
213	X-3944-363-1	ROLLER ASSY, HC	213	X-3944-363-4	ROLLER ASSY, HC
215	X-3945-651-1	ARM (T) ASSY, MAIN BRAKE	215	X-3945-444-1	ARM (T) ASSY, MAIN BRAKE
217	X-3943-896-1	ARM ASSY, HC			not supplied
			225	3-969-629-01	BASE, DRUM

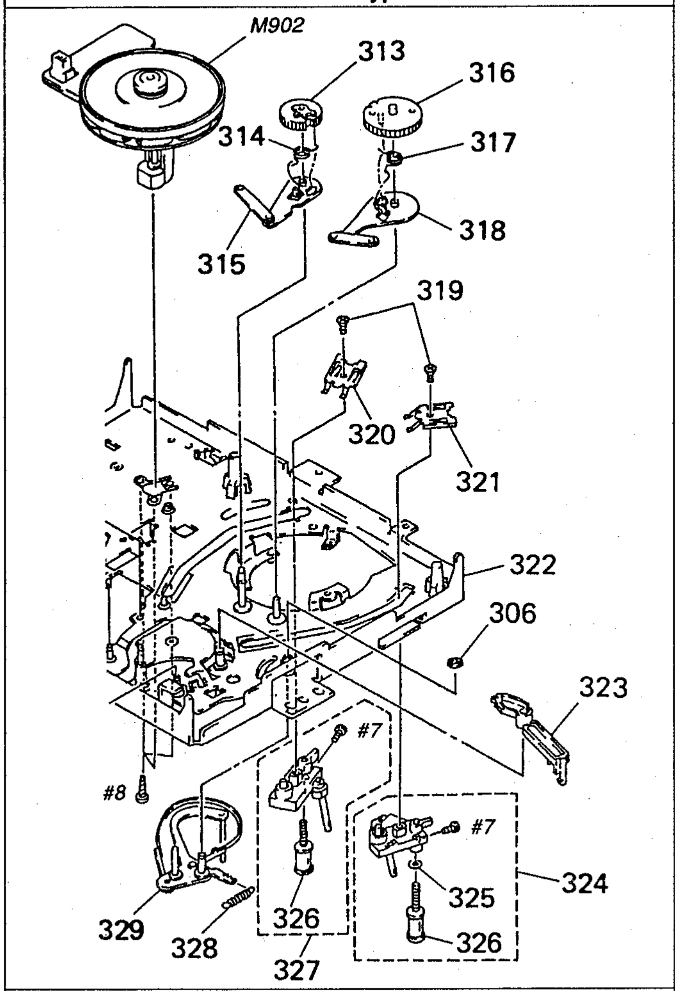
4-4. MECHANISM CHASSIS ASSEMBLY (3) (See page 5-9)

Former Type			New Type		
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
259	3-701-439-21	WASHER			
271	3-965-977-01	RETAINER, CAM GEAR	271	3-965-977-03	RETAINER, CAM GEAR

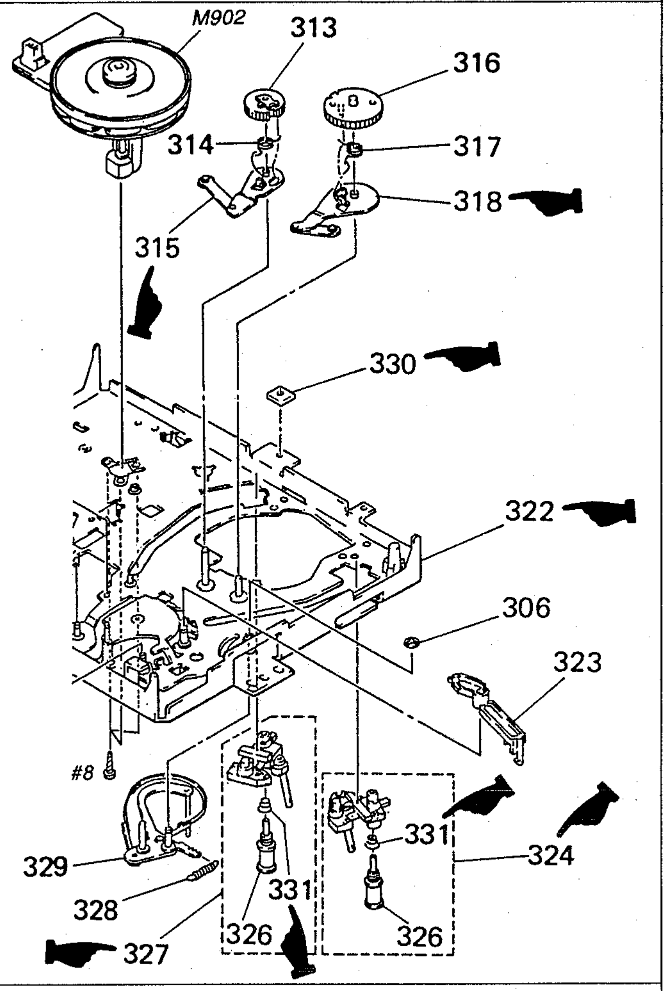
4-5. MECHANISM CHASSIS ASSEMBLY (4) (See page 5-10)

☞ : Modificated portion

Former Type


M902
313
316
314
317
318
315
319
320
321
322
306
323
#7
#8
#7
325
324
329
328
326
326
327

New Type


M902
313
316
314
317
318
315
330
322
306
323
#8
331
324
329
331
328
327
326
326

Former Type			New Type		
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
315	X-3943-891-1	LEVER (T) ASSY, LOADING	315	X-3943-891-3	LEVER (T) ASSY, LOADING
318	X-3943-890-1	LEVER (S) ASSY, LOADING	318	X-3943-890-2	LEVER (S) ASSY, LOADING
319	3-960-720-01	SCREW			
320	3-960-688-01	SPRING, LEAF (T), LOADING			
321	3-960-687-01	SPRING, LEAF (T), LOADING			
322	X-3945-485-1	CHASSIS ASSY, MECHANICAL	322	X-3945-485-4	CHASSIS ASSY, MECHANICAL
324	A-6750-316-A	SHUTTLE (S) BLOCK ASSY	324	A-6750-324-A	SHUTTLE (S) BLOCK ASSY
325	3-962-874-01	O-RING			
327	A-6750-314-A	T BLOCK ASSY, SHUTTLE	327	A-6750-325-A	T BLOCK ASSY, SHUTTLE
			330	3-965-923-01	RUBBER, SPACER
			331	3-965-178-01	SPRING

MA-278

5. ELECTRICAL PARTS LIST (SLV-X715/X815)

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	A-6791-036-A	MA-278 BOARD, COMPLETE (X815PS)			
*	A-6791-037-A	MA-278 BOARD, COMPLETE (X815ME)			
*	A-6791-038-A	MA-278 BOARD, COMPLETE (X815SG)			
*	A-6791-039-A	MA-278 BOARD, COMPLETE (X715PS)			
*	A-6791-041-A	MA-278 BOARD, COMPLETE (X715SG)			
*	A-6791-040-A	MA-278 BOARD, COMPLETE (X715ME)			
		**********************			
		(Ref. No. 4,000 Series)			
*	3-960-273-01	SPACER, TOP END			
*	3-960-274-01	SPACER, LED			
		< CAPACITOR >			
C101	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C102	1-126-967-11	ELECT	47uF	20%	16V
C103	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C104	1-124-234-00	ELECT	22uF	20%	16V
C105	1-124-584-00	ELECT	100uF	20%	10V
C106	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C107	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C108	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C109	1-124-257-00	ELECT	2.2uF	20%	50V
C111	1-124-257-00	ELECT	2.2uF	20%	50V
C113	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C114	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C160	1-125-507-11	CAPACITOR	0.22F		5.5V
C201	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C202	1-164-346-11	CERAMIC CHIP	1uF		16V
C203	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C204	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C205	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C206	1-164-346-11	CERAMIC CHIP	1uF		16V
C207	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C208	1-124-584-00	ELECT	100uF	20%	10V
C209	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C210	1-124-589-11	ELECT	47uF	20%	16V
C211	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C214	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C215	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C216	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C252	1-162-638-11	CERAMIC CHIP	1uF		16V
C253	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C254	1-124-589-11	ELECT	47uF	20%	16V
C255	1-130-489-00	MYLAR	0.033uF	5%	50V
C256	1-137-441-11	FILM	0.027uF	5%	50V
C261	1-126-176-11	ELECT	220uF	20%	10V
C262	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C264	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C266	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C267	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C273	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C275	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C291	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C292	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C294	1-124-455-00	ELECT	100uF	20%	16V
C295	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C296	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C297	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C301	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C302	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C304	1-124-589-11	ELECT	47uF	20%	16V
C305	1-124-589-11	ELECT	47uF	20%	16V
C306	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C307	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C308	1-126-964-11	ELECT	10uF	20%	50V
C309	1-124-589-11	ELECT	47uF	20%	16V
C310	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C312	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C313	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C331	1-163-124-00	CERAMIC CHIP	200PF	5%	50V
C351	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C352	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C353	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C354	1-124-589-11	ELECT	47uF	20%	16V
C356	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C357	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C358	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C359	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C360	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C401	1-124-589-11	ELECT	47uF	20%	16V

Ref. No.	Part No.	Description			Remark
C402	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C409	1-124-589-11	ELECT	47uF	20%	16V
C410	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C415	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C416	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C417	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C418	1-126-160-11	ELECT	1uF	20%	50V
C420	1-130-481-00	MYLAR	0.0068uF	5%	50V
C421	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V
C422	1-130-487-00	MYLAR	0.022uF	5%	50V
C423	1-124-465-00	ELECT	0.47uF	20%	50V
C424	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C425	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C427	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C431	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C432	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C441	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C442	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C443	1-124-589-11	ELECT	47uF	20%	16V
C461	1-162-306-11	CERAMIC	0.01uF	30%	16V
C462	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C463	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C464	1-162-306-11	CERAMIC	0.01uF	30%	16V
C465	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C466	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C501	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V (X815)
C502	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V (X815)
C503	1-124-589-11	ELECT	47uF	20%	16V (X815)
C510	1-163-075-00	CERAMIC CHIP	0.047uF		50V (X815)
C520	1-126-162-11	ELECT	3.3uF	20%	50V (X815)
C521	1-126-964-11	ELECT	10uF	20%	50V (X815)
C522	1-137-372-11	FILM	0.022uF	5%	50V (X815)
C523	1-126-963-11	ELECT	4.7uF	20%	50V (X815)
C524	1-124-589-11	ELECT	47uF	20%	16V (X815)
C525	1-137-370-11	FILM	0.01uF	5%	50V (X815)
C530	1-126-162-11	ELECT	3.3uF	20%	50V (X815)
C531	1-126-964-11	ELECT	10uF	20%	50V (X815)

Ref. No.	Part No.	Description			Remark
C532	1-137-372-11	FILM	0.022uF	5%	50V (X815)
C533	1-126-963-11	ELECT	4.7uF	20%	50V (X815)
C534	1-124-589-11	ELECT	47uF	20%	16V (X815)
C535	1-137-370-11	FILM	0.01uF	5%	50V (X815)
C541	1-137-372-11	FILM	0.022uF	5%	50V (X815)
C542	1-126-235-11	ELECT	100uF	20%	10V (X815)
C551	1-124-234-00	ELECT	22uF	20%	16V (X815)
C552	1-124-234-00	ELECT	22uF	20%	16V (X815)
C561	1-126-160-11	ELECT	1uF	20%	50V
C562	1-137-370-11	FILM	0.01uF	5%	50V
C563	1-126-163-11	ELECT	4.7uF	20%	50V
C565	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C566	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C571	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V (X815)
C572	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V (X815)
C591	1-124-584-00	ELECT	100uF	20%	10V (X815)
C592	1-126-235-11	ELECT	100uF	20%	10V (X815)
C593	1-124-589-11	ELECT	47uF	20%	16V (X815)
C682	1-126-967-11	ELECT	47uF	20%	16V
C683	1-126-935-11	ELECT	470uF	20%	6.3V
C684	1-126-967-11	ELECT	47uF	20%	16V
C701	1-126-967-11	ELECT	47uF	20%	16V
C702	1-126-964-11	ELECT	10uF	20%	50V
C703	1-126-964-11	ELECT	10uF	20%	50V (X815)
C704	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C705	1-126-964-11	ELECT	10uF	20%	50V
C706	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C707	1-126-967-11	ELECT	47uF	20%	16V
C708	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C711	1-126-935-11	ELECT	470uF	20%	16V
C712	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C713	1-126-967-11	ELECT	47uF	20%	16V
C714	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C716	1-126-964-11	ELECT	10uF	20%	50V (X815)
C717	1-126-964-11	ELECT	10uF	20%	50V

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Ref. No.	Part No.	Description			Remark
C721	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C727	1-126-933-11	ELECT	100uF	20%	10V
C851	1-126-157-11	ELECT	10uF	20%	16V (X715)
C852	1-124-234-00	ELECT	22uF	20%	16V (X715)
C853	1-124-234-00	ELECT	22uF	20%	16V (X715)
C854	1-124-252-00	ELECT	0.33uF	20%	50V (X715)
C855	1-126-157-11	ELECT	10uF	20%	16V (X715)
C856	1-126-160-11	ELECT	1uF	20%	50V (X715)
C857	1-126-160-11	ELECT	1uF	20%	50V (X715)
C858	1-126-160-11	ELECT	1uF	20%	50V (X715)
C864	1-126-162-11	ELECT	3.3uF	20%	50V (X715)
C871	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V (X715)
C872	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V (X715)
C873	1-124-257-00	ELECT	2.2uF	20%	50V
C881	1-104-696-11	FILM	0.015uF	5%	100V (X815)
C881	1-137-612-11	FILM	0.0068uF	5%	100V (X715)
C882	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C883	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C884	1-126-933-11	ELECT	100uF	20%	16V
C885	1-137-431-11	FILM	560PF	5%	50V
C891	1-104-697-11	FILM	0.047uF	5%	100V (X715)
C892	1-164-232-11	CERAMIC CHIP	0.01uF		50V (X715)
C893	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V (X715)
C894	1-126-933-11	ELECT	100uF	20%	16V (X715)
C901	1-163-031-11	CERAMIC CHIP	0.01uF		50V
		< JACK >			
CJ621	1-764-222-11	JACK, PIN 6P (LINE-1 IN/LINE OUT)			(X815)
CJ621	1-568-185-21	JACK, PIN 4P (LINE-1 IN/LINE OUT)			(X715)

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN101	1-506-468-11	PIN, CONNECTOR 3P	
* CN271	1-766-538-11	CONNECTOR, BOARD TO BOARD 8P	
* CN275	1-766-717-11	CONNECTOR, BOARD TO BOARD 5P	
* CN281	1-766-537-11	CONNECTOR (HMD) 5P	
* CN291	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P	
CN301	1-766-718-11	CONNECTOR, BOARD TO BOARD 17P	
* CN501	1-766-600-11	CONNECTOR, BOARD TO BOARD 7P	
CN851	1-506-469-11	PIN, CONNECTOR 4P	
CN881	1-564-002-11	PIN, CONNECTOR 3P	
CN903	1-774-461-11	CONNECTOR, FFC/FPC 15P	
CN905	1-506-470-11	PIN, CONNECTOR 5P	(X815)
CN905	1-506-469-11	PIN, CONNECTOR 4P	(X715)
CN906	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P	
CN908	1-506-473-11	PIN, CONNECTOR 8P	
		< TRIMMER >	
CT401	1-141-334-11	CAP, VAR, TRIMMER	
		< DIODE >	
D201	8-719-200-82	DIODE 11ES2	
D202	8-719-048-07	DIODE M1MA151WKT1	
D203	8-719-048-07	DIODE M1MA151WKT1	(X715)
D204	8-719-200-82	DIODE 11ES2	
D251	8-719-048-07	DIODE M1MA151WKT1	
D261	8-719-048-26	DIODE GL528V1	
D265	8-719-109-93	DIODE RD6.2ES-B2	
D267	8-719-109-93	DIODE RD6.2ES-B2	
D291	8-719-923-60	DIODE MTZJ-T-77-9.1	
D403	8-719-048-07	DIODE M1MA151WKT1	
D591	8-719-911-19	DIODE 1SS119	(X815)
D610	8-719-109-74	DIODE RD4.3ES-B1	
D701	8-719-200-82	DIODE 11ES2	
D702	8-719-800-76	DIODE 1SS226	
D703	8-719-110-78	DIODE RD33ES-B2	
D708	8-719-911-19	DIODE 1SS119	
D853	8-719-911-19	DIODE 1SS119	(X715)
D902	8-719-200-82	DIODE 11ES2	
D903	8-719-911-19	DIODE 1SS119	
D904	8-719-911-19	DIODE 1SS119	
		< IC >	
IC101	8-759-246-14	IC TA8823N	
IC201	8-752-872-72	IC CXP87360-045Q	
IC202	8-759-248-87	IC MM1256XF-BE	
IC203	8-759-278-56	IC AK6440HF-E2	
IC251	8-759-335-76	IC uPC5023GR-089-E2	
IC291	8-759-294-26	IC BA6209-V2	

Ref. No.	Part No.	Description	Remark
IC301	1-801-168-11	IC YC MODULE 3 (MULTI)	
IC401	8-759-363-38	IC LC74761M-9149-TLM	
IC441	1-810-636-11	IC LA7356M-TLM	
IC461	8-759-295-66	IC BA7653AF-E2	
IC501	8-759-365-32	IC XLH7779K-VP	(X815)
IC551	8-759-089-84	IC BA7755AF-T1	(X815)
IC851	8-759-268-02	IC BA7796FS-E2	(X715)

< JUMPER RESISTOR >

Ref. No.	Part No.	Description	Remark
JP294	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP295	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP296	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP297	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP298	1-216-296-00	METAL CHIP 0 5% 1/8W	(X815)
JP301	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP302	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP303	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP304	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP305	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP306	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP307	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP308	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP309	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP310	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP311	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP312	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP313	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP314	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP315	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP316	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP317	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP318	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP319	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP320	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP321	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP323	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP325	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP326	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP327	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP328	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP329	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP330	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP331	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP332	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP333	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP334	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP335	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP336	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP337	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP338	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP339	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP340	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP341	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP342	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP343	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP344	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP346	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP347	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP348	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP349	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP350	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP351	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP352	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP353	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP354	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP355	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP356	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP357	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP359	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP360	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP361	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP362	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP363	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP364	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP366	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP367	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP368	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP369	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP371	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP372	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP373	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP374	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP375	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP376	1-216-296-00	METAL CHIP 0 5% 1/8W	(X715)
JP377	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP380	1-216-296-00	METAL CHIP 0 5% 1/8W	
JP381	1-216-295-00	METAL CHIP 0 5% 1/10W	
JP382	1-216-296-00	METAL CHIP 0 5% 1/8W	

< JUMPER RESISTOR >

Ref. No.	Part No.	Description	Remark
JR222	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR223	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR307	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR308	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR401	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR701	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR708	1-216-295-00	METAL CHIP 0 5% 1/10W	(X815)
JR731	1-216-295-00	METAL CHIP 0 5% 1/10W	

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Ref. No.	Part No.	Description	Remark
JR732	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR735	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR851	1-216-295-00	METAL CHIP 0 5% 1/10W	(X715)
JR852	1-216-295-00	METAL CHIP 0 5% 1/10W	(X715)
JR885	1-216-295-00	METAL CHIP 0 5% 1/10W	(X815)
JR895	1-216-295-00	METAL CHIP 0 5% 1/10W	(X715)
		< COIL >	
L101	1-408-421-00	INDUCTOR 100uH	
L201	1-408-970-21	INDUCTOR 10uH	
L302	1-414-186-31	INDUCTOR 33uH	
L303	1-414-186-31	INDUCTOR 33uH	
L304	1-408-416-00	INDUCTOR 39uH	
L305	1-414-186-31	INDUCTOR 33uH	
L306	1-410-514-11	INDUCTOR 27uH	
L351	1-410-524-41	INDUCTOR 180uH	
L352	1-414-189-31	INDUCTOR 100uH	
L353	1-410-513-11	INDUCTOR 22uH	
L401	1-408-421-00	INDUCTOR 100uH	
L402	1-408-421-00	INDUCTOR 100uH	
L403	1-410-513-11	INDUCTOR 22uH	
L404	1-410-506-11	INDUCTOR 5.6uH	
L444	1-414-189-31	INDUCTOR 100uH	
L461	1-414-189-31	INDUCTOR 100uH	
L681	1-410-482-31	INDUCTOR 100uH	
L702	1-414-189-31	INDUCTOR 100uH	
L703	1-414-183-41	INDUCTOR 10uH	
L704	1-410-501-11	INDUCTOR 2.2uH	
L705	1-414-187-11	INDUCTOR 47uH	
L707	1-410-501-11	INDUCTOR 2.2uH	
L851	1-410-482-31	INDUCTOR 100uH	(X715)
L881	1-410-687-11	INDUCTOR 1.2mH	
L891	1-410-687-11	INDUCTOR 1.2mH	(X715)
L901	1-412-364-11	INDUCTOR 0uH	
		< PHOTO INTERRUPTER >	
PH261	8-749-010-19	PHOTO INTERRUPTER GP3S113	
PH262	8-749-010-20	PHOTO INTERRUPTER GP3S114	
		< IC LINK >	
⚠PS271	1-532-727-11	LINK, IC ICP-N5 (0.25A)	
⚠PS885	1-532-727-11	LINK, IC ICP-N5 (0.25A)	
		< THERMISTOR >	
⚠PTH592	1-202-855-00	THERMISTOR, POSITIVE	(X815)

Ref. No.	Part No.	Description	Remark
		< TRANSISTOR >	
Q201	8-729-010-29	TRANSISTOR MSD601-RST1	
Q202	8-729-901-06	TRANSISTOR DTA144EK	
Q261	8-729-025-92	PHOTO TRANSISTOR PT380F	
Q262	8-729-025-92	PHOTO TRANSISTOR PT380F	
Q263	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q301	8-729-421-19	TRANSISTOR UN2213	
Q303	8-729-010-29	TRANSISTOR MSD601-RST1	
Q305	8-729-901-06	TRANSISTOR DTA144EK	
Q332	8-729-421-19	TRANSISTOR UN2213	
Q333	8-729-421-19	TRANSISTOR UN2213	
Q351	8-729-421-19	TRANSISTOR UN2213	
Q352	8-729-010-29	TRANSISTOR MSD601-RST1	
Q353	8-729-010-29	TRANSISTOR MSD601-RST1	
Q404	8-729-010-05	TRANSISTOR MSB709-RT1	
Q405	8-729-010-05	TRANSISTOR MSB709-RT1	
Q406	8-729-010-05	TRANSISTOR MSB709-RT1	
Q522	8-729-421-19	TRANSISTOR UN2213	(X815)
Q532	8-729-421-19	TRANSISTOR UN2213	(X815)
Q591	8-729-804-41	TRANSISTOR 2SB1122-S	(X815)
Q592	8-729-820-68	TRANSISTOR 2SD1802FA-S	(X815)
Q681	8-729-010-05	TRANSISTOR MSB709-RT1	
⚠Q703	8-729-173-38	TRANSISTOR 2SA733-K	
Q710	8-729-010-05	TRANSISTOR MSB709-RT1	
Q711	8-729-424-67	TRANSISTOR UN2216	
Q712	8-729-424-67	TRANSISTOR UN2216	(X815)
Q713	8-729-424-67	TRANSISTOR UN2216	(X815)
Q714	8-729-010-05	TRANSISTOR MSB709-RT1	
Q853	8-729-424-67	TRANSISTOR UN2216	(X715)
Q881	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q	
Q882	8-729-900-51	TRANSISTOR DTA114TK	
Q886	8-729-010-29	TRANSISTOR MSD601-RST1	
Q891	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q	(X715)
Q892	8-729-900-51	TRANSISTOR DTA114TK	(X715)
		< RESISTOR >	
R101	1-247-901-11	CARBON 820K 5% 1/4W	
R102	1-249-439-11	CARBON 68K 5% 1/4W	
R103	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R104	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R105	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R106	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R107	1-216-037-00	METAL CHIP 330 5% 1/10W	
R108	1-216-121-91	METAL GLAZE 1M 5% 1/10W	
R111	1-216-097-91	METAL GLAZE 100K 5% 1/10W	
R201	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R202	1-247-863-91	CARBON 22K 5% 1/4W	(X815PS)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
R202	1-249-430-11	CARBON	12K	5%	1/4W(X815ME)
R202	1-249-428-11	CARBON	8. 2K	5%	1/4W(X815SG)
R202	1-249-425-11	CARBON	4. 7K	5%	1/4W(X715PS)
R202	1-249-421-11	CARBON	2. 2K	5%	1/4W(X715ME)
R203	1-216-222-00	METAL GLAZE	10K	5%	1/8W
R204	1-249-429-11	CARBON	10K	5%	1/4W (X715ME/PS, X815)
R206	1-249-429-11	CARBON	10K	5%	1/4W
R207	1-216-065-00	METAL CHIP	4. 7K	5%	1/10W
R208	1-216-049-00	METAL CHIP	1K	5%	1/10W
R209	1-216-073-00	METAL CHIP	10K	5%	1/10W
R210	1-216-073-00	METAL CHIP	10K	5%	1/10W
R211	1-216-107-00	METAL CHIP	270K	5%	1/10W
R212	1-216-095-00	METAL CHIP	82K	5%	1/10W
R213	1-216-226-00	METAL GLAZE	15K	5%	1/8W
R214	1-216-234-00	METAL GLAZE	33K	5%	1/8W
R215	1-216-244-00	METAL GLAZE	82K	5%	1/8W
R216	1-216-083-00	METAL CHIP	27K	5%	1/10W (X715)
R217	1-216-085-00	METAL CHIP	33K	5%	1/10W (X715)
R218	1-216-238-91	METAL GLAZE	47K	5%	1/8W
R219	1-216-198-91	METAL GLAZE	1K	5%	1/8W
R220	1-216-089-00	METAL CHIP	47K	5%	1/10W
R221	1-216-089-00	METAL CHIP	47K	5%	1/10W
R222	1-216-113-00	METAL CHIP	470K	5%	1/10W
R223	1-216-089-00	METAL CHIP	47K	5%	1/10W
R224	1-216-025-91	METAL GLAZE	100	5%	1/10W
R225	1-216-053-00	METAL CHIP	1. 5K	5%	1/10W
R226	1-216-025-91	METAL GLAZE	100	5%	1/10W
R227	1-249-417-11	CARBON	1K	5%	1/4W
R228	1-216-049-00	METAL CHIP	1K	5%	1/10W
R229	1-216-109-00	METAL CHIP	330K	5%	1/10W
R230	1-216-105-91	METAL GLAZE	220K	5%	1/10W
R233	1-216-206-00	METAL GLAZE	2. 2K	5%	1/8W
R234	1-216-198-91	METAL GLAZE	1K	5%	1/8W
R251	1-216-049-00	METAL CHIP	1K	5%	1/10W
R253	1-216-689-11	METAL CHIP	39K	0. 5%	1/10W
R254	1-216-057-00	METAL CHIP	2. 2K	5%	1/10W
R255	1-216-057-00	METAL CHIP	2. 2K	5%	1/10W
R256	1-216-103-00	METAL CHIP	180K	5%	1/10W
R261	1-249-400-11	CARBON	39	5%	1/4W
R262	1-216-164-00	METAL GLAZE	39	5%	1/8W
R263	1-216-057-00	METAL CHIP	2. 2K	5%	1/10W
R264	1-247-889-00	CARBON	270K	5%	1/4W
R265	1-216-256-00	METAL GLAZE	270K	5%	1/8W
R266	1-249-413-11	CARBON	470	5%	1/4W
R267	1-216-089-00	METAL CHIP	47K	5%	1/10W
R268	1-216-089-00	METAL CHIP	47K	5%	1/10W
R271	1-216-065-00	METAL CHIP	4. 7K	5%	1/10W
R274	1-249-434-11	CARBON	27K	5%	1/4W
R275	1-216-093-00	METAL CHIP	68K	5%	1/10W
R276	1-216-056-00	METAL GLAZE	2K	5%	1/10W
R277	1-216-217-00	METAL GLAZE	6. 2K	5%	1/8W
R278	1-249-430-11	CARBON	12K	5%	1/4W
R281	1-216-238-91	METAL GLAZE	47K	5%	1/8W
R282	1-216-238-91	METAL GLAZE	47K	5%	1/8W
R283	1-216-238-91	METAL GLAZE	47K	5%	1/8W
R284	1-216-238-91	METAL GLAZE	47K	5%	1/8W
R293	1-216-295-00	METAL CHIP	0	5%	1/10W
R301	1-216-037-00	METAL CHIP	330	5%	1/10W
R302	1-216-053-00	METAL CHIP	1. 5K	5%	1/10W
R303	1-216-295-00	METAL CHIP	0	5%	1/10W
R304	1-208-798-11	METAL GLAZE	4. 7K	0. 50%	1/10W
R305	1-216-057-00	METAL CHIP	2. 2K	5%	1/10W
R306	1-249-436-11	CARBON	39K	5%	1/4W
R307	1-249-413-11	CARBON	470	5%	1/4W
R309	1-216-057-00	METAL CHIP	2. 2K	5%	1/10W
R310	1-216-073-00	METAL CHIP	10K	5%	1/10W
R311	1-216-057-00	METAL CHIP	2. 2K	5%	1/10W
R312	1-216-073-00	METAL CHIP	10K	5%	1/10W
R313	1-249-413-11	CARBON	470	5%	1/4W
R315	1-216-103-00	METAL CHIP	180K	5%	1/10W
R332	1-216-052-00	METAL CHIP	1. 3K	5%	1/10W
R333	1-208-799-11	METAL GLAZE	5. 1K	0. 50%	1/10W
R334	1-216-295-00	METAL CHIP	0	5%	1/10W
R351	1-216-049-00	METAL CHIP	1K	5%	1/10W
R352	1-216-051-00	METAL CHIP	1. 2K	5%	1/10W
R353	1-216-045-00	METAL CHIP	680	5%	1/10W
R354	1-216-081-00	METAL CHIP	22K	5%	1/10W
R355	1-216-081-00	METAL CHIP	22K	5%	1/10W
R356	1-216-055-00	METAL CHIP	1. 8K	5%	1/10W
R357	1-216-067-00	METAL CHIP	5. 6K	5%	1/10W
R358	1-216-041-00	METAL CHIP	470	5%	1/10W
R413	1-216-049-00	METAL CHIP	1K	5%	1/10W
R414	1-216-057-00	METAL CHIP	2. 2K	5%	1/10W
R415	1-216-053-00	METAL CHIP	1. 5K	5%	1/10W
R416	1-216-069-00	METAL CHIP	6. 8K	5%	1/10W
R417	1-216-049-00	METAL CHIP	1K	5%	1/10W
R418	1-216-045-00	METAL CHIP	680	5%	1/10W
R419	1-216-089-00	METAL CHIP	47K	5%	1/10W
R420	1-216-065-00	METAL CHIP	4. 7K	5%	1/10W
R421	1-216-057-00	METAL CHIP	2. 2K	5%	1/10W
R422	1-216-049-00	METAL CHIP	1K	5%	1/10W
R423	1-216-057-00	METAL CHIP	2. 2K	5%	1/10W
R425	1-216-049-00	METAL CHIP	1K	5%	1/10W
R431	1-247-863-91	CARBON	22K	5%	1/4W
R432	1-216-121-91	METAL GLAZE	1M	5%	1/10W
R442	1-216-057-00	METAL CHIP	2. 2K	5%	1/10W
R443	1-216-070-00	METAL CHIP	7. 5K	5%	1/10W

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Ref. No.	Part No.	Description				Remark
R462	1-216-295-00	METAL CHIP	0	5%	1/10W	
R501	1-249-425-11	CARBON	4.7K	5%	1/4W	(X815)
R502	1-249-425-11	CARBON	4.7K	5%	1/4W	(X815)
R503	1-249-425-11	CARBON	4.7K	5%	1/4W	(X815)
R504	1-249-425-11	CARBON	4.7K	5%	1/4W	(X815)
R505	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X815)
R506	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X815)
R507	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X815)
R510	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	(X815)
R514	1-216-049-00	METAL CHIP	1K	5%	1/10W	(X815)
R515	1-216-049-00	METAL CHIP	1K	5%	1/10W	(X815)
R521	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X815)
R522	1-216-050-00	METAL GLAZE	1.1K	5%	1/10W	(X815)
R523	1-216-079-00	METAL CHIP	18K	5%	1/10W	(X815)
R524	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	(X815)
R525	1-208-809-11	METAL GLAZE	13K	0.50%	1/10W	(X815)
R531	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X815)
R532	1-216-050-00	METAL GLAZE	1.1K	5%	1/10W	(X815)
R533	1-216-079-00	METAL CHIP	18K	5%	1/10W	(X815)
R534	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	(X815)
R535	1-208-806-11	METAL GLAZE	10K	0.50%	1/10W	(X815)
R541	1-247-863-91	CARBON	22K	5%	1/4W	(X815)
R551	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	(X815)
R561	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R562	1-216-109-00	METAL CHIP	330K	5%	1/10W	
R563	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R564	1-216-041-00	METAL CHIP	470	5%	1/10W	
R565	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R566	1-216-099-00	METAL CHIP	120K	5%	1/10W	
R571	1-216-077-00	METAL CHIP	15K	5%	1/10W	(X815)
R572	1-216-095-00	METAL CHIP	82K	5%	1/10W	(X815)
R573	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(X815)
R591	1-249-421-11	CARBON	2.2K	5%	1/4W	(X815)
R592	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	(X815)
R601	1-216-022-00	METAL CHIP	75	5%	1/10W	
R611	1-249-413-11	CARBON	470	5%	1/4W	
R612	1-216-041-00	METAL CHIP	470	5%	1/10W	(X815)
R681	1-249-411-11	CARBON	330	5%	1/4W	
R683	1-249-407-11	CARBON	150	5%	1/4W	
R684	1-249-408-11	CARBON	180	5%	1/4W	
R685	1-216-021-00	METAL CHIP	68	5%	1/10W	
R703	1-249-404-00	CARBON	82	5%	1/4W	
R704	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R705	1-249-421-11	CARBON	2.2K	5%	1/4W	
R709	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R710	1-216-049-00	METAL CHIP	1K	5%	1/10W	(X815)
R711	1-249-429-11	CARBON	10K	5%	1/4W	
R712	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R719	1-249-417-11	CARBON	1K	5%	1/4W	
R720	1-249-417-11	CARBON	1K	5%	1/4W	
R721	1-249-411-11	CARBON	330	5%	1/4W	
R722	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R738	1-216-025-91	METAL GLAZE	100	5%	1/10W	
R755	1-216-121-91	METAL GLAZE	1M	5%	1/10W	
R851	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	(X715)
R852	1-249-417-11	CARBON	1K	5%	1/4W	(X715)
R853	1-216-041-00	METAL CHIP	470	5%	1/10W	(X715)
R854	1-216-089-00	METAL CHIP	47K	5%	1/10W	(X715)
R855	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	(X715)
R856	1-216-089-00	METAL CHIP	47K	5%	1/10W	(X715)
R857	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	(X715)
R858	1-216-093-00	METAL CHIP	68K	5%	1/10W	(X715)
R859	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(X715)
R871	1-216-077-00	METAL CHIP	15K	5%	1/10W	(X715)
R872	1-216-095-00	METAL CHIP	82K	5%	1/10W	(X715)
R873	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(X715)
R874	1-216-073-00	METAL CHIP	10K	5%	1/10W	(X815)
R874	1-216-075-00	METAL CHIP	12K	5%	1/10W	(X715)
R881	1-216-081-00	METAL CHIP	22K	5%	1/10W	
⚠R882	1-249-389-11	CARBON	4.7	5%	1/4W F	(X815)
⚠R882	1-249-395-11	CARBON	15	5%	1/4W F	(X715)
R885	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R886	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R887	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R891	1-216-083-00	METAL CHIP	27K	5%	1/10W	(X715)
R892	1-249-394-11	CARBON	12	5%	1/4W	(X715)

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV521	1-241-763-11	RES, ADJ, CERMET 4.7K	(X815)
RV522	1-241-885-11	RES, ADJ, CERMET 470K	(X815)
RV531	1-241-763-11	RES, ADJ, CERMET 4.7K	(X815)
RV532	1-241-885-11	RES, ADJ, CERMET 470K	(X815)
RV541	1-241-764-11	RES, ADJ, CERMET 10K	(X815)

< SWITCH >

Ref. No.	Part No.	Description	Remark
S251	1-570-953-11	SWITCH, PUSH (1 KEY)(REC PRF.)	
S701	1-571-588-11	SWITCH, SLIDE (RF UNIT CH3/CH4)	
S902	1-762-207-11	SWITCH, SLIDE (NTSC PB)	

< TRANSFORMER >

Ref. No.	Part No.	Description	Remark
T881	1-423-414-11	TRANSFORMER, BIAS OSCILLATION	(X815)
T881	1-423-413-11	TRANSFORMER, BIAS OSCILLATION	(X715)
T891	1-423-415-11	TRANSFORMER, BIAS OSCILLATION	(X715)

< TUNER >

Ref. No.	Part No.	Description	Remark
⚠TU702	1-693-319-11	TUNER, RF MOD/IF	

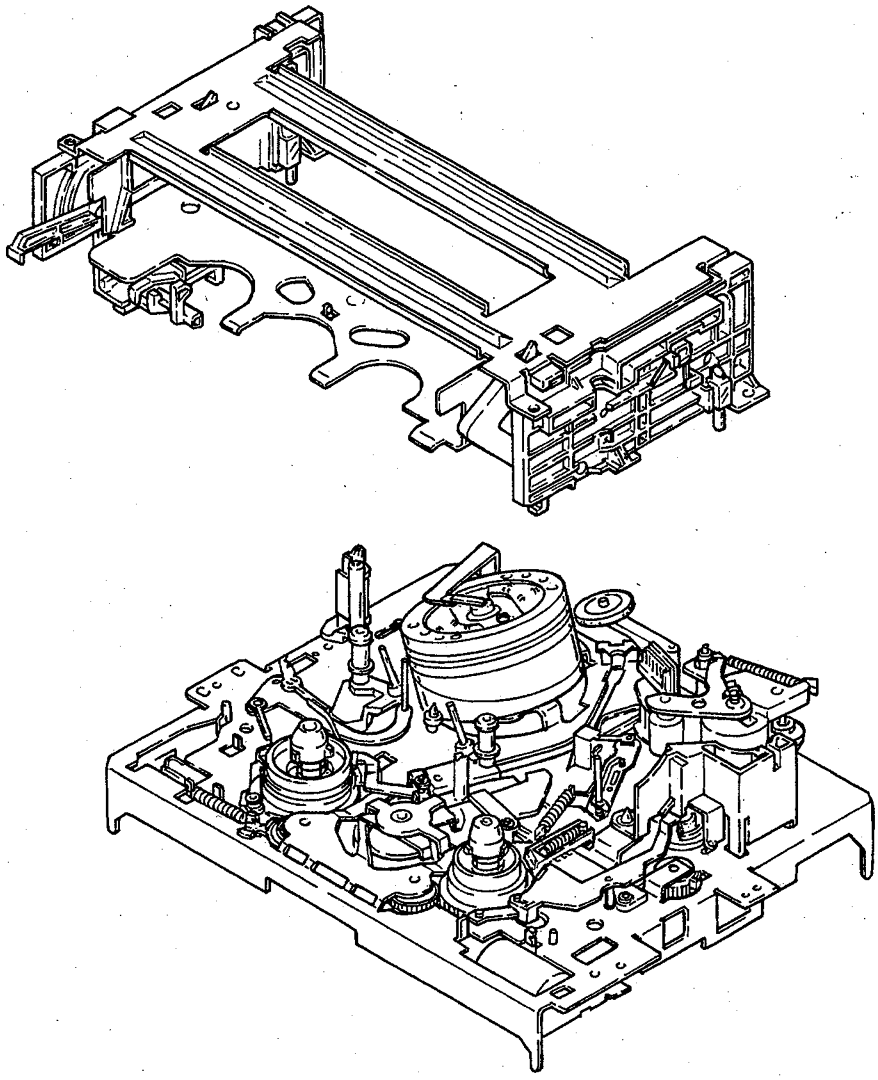
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
		< VIBRATOR >	
X201	1-760-494-11	VIBRATOR, CRYSTAL (16MHz)	
X202	1-579-463-11	VIBRATOR, CRYSTAL (32.768KHz)	
X402	1-577-289-11	VIBRATOR, CRYSTAL (14MHz)	

VHS MECHANICAL ADJUSTMENT MANUAL IV

H MECHANISM

Please use with the service manual.



VHS VIDEO CASSETTE RECORDER

SONY®

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1. PREPARATION FOR MECHANISM CHECK ADJUSTMENT AND REPLACEMENT

Refer to the service manual, "DISASSEMBLY" for removal of the cabinet and boards.

1-1. LOADING AND THREADING PROCEDURE WHEN THE POWER TURNS OFF (Fig. 1-1)

1-1-1. LOADING AND THREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow 🅐 direction until loading and threading are end.

1-1-2. LOADING AND THREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Applying approx. +9 V (300 mA) to cam motor with regulated DC power supply makes it loading and threading.

Note: When loading and threading without cassette, claws are caught in four positions as following figure (in the order① → ② → ③ → ④).
So release them with hands.

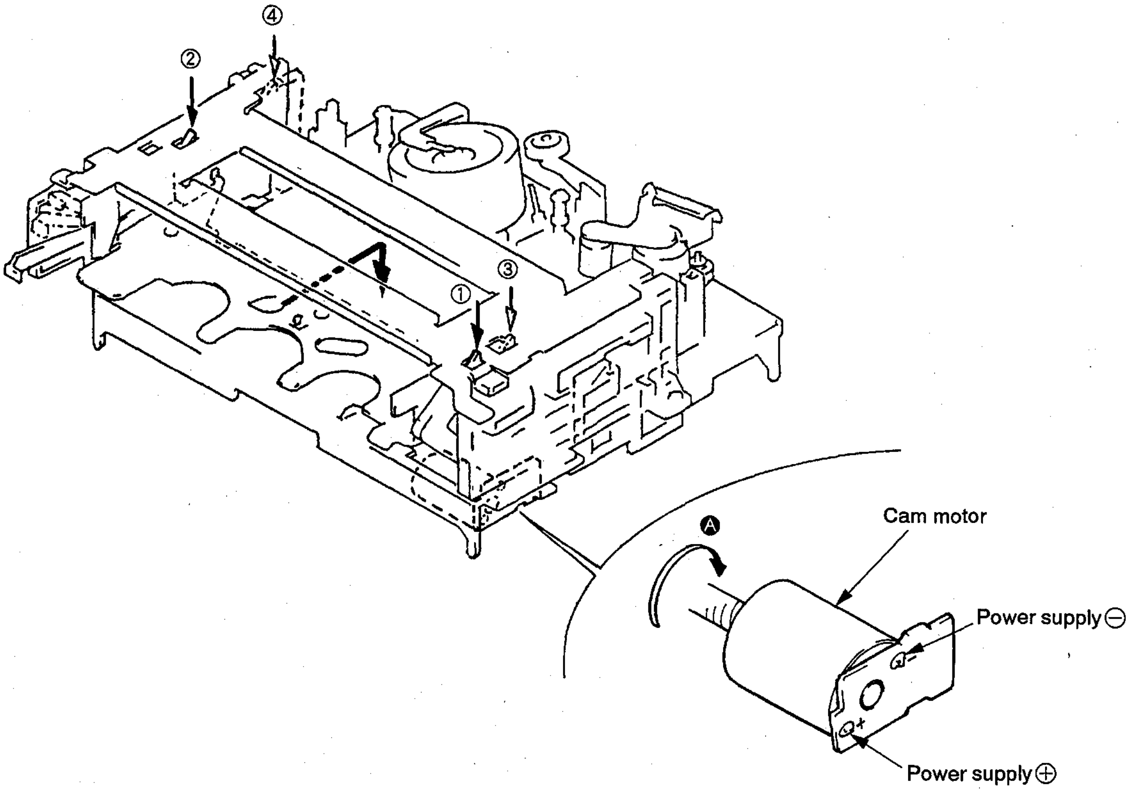


Fig. 1-1

1-2. UNLOADING AND UNTHREADING PROCEDURE WHEN THE POWER TURNS OFF (Figs. 1-2 and 1-3)

1-2-1. UNLOADING AND UNTHREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow Ⓑ direction until unthreading is end.
2) Turn capstan motor in the arrow Ⓒ direction to take up tape in cassette.
3) Turn cam motor in the arrow Ⓑ direction until unloading is end.

1-2-2. UNLOADING AND UNTHREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Apply approx. +9 V (300 mA) to contrary polarities of cam motor.
2) Unthreading operation begins, tape guides return to their original positions (Unthreading operation is end but tape remains), then stop cam motor by turning power off.

Note: When unloading begins and cassette lid is closed, turn cam motor in the arrow Ⓐ direction to open tape guard.

3) Turn capstan motor in the arrow Ⓒ direction to take up tape in cassette.

Note: That tape is not caught at pinch roller. (Fig. 1-3)

4) Check that tape is not loosened completely, and apply approx. +9 V (300 mA) to contrary polarities of cam motor with regulated DC power supply. (Fig. 1-2)

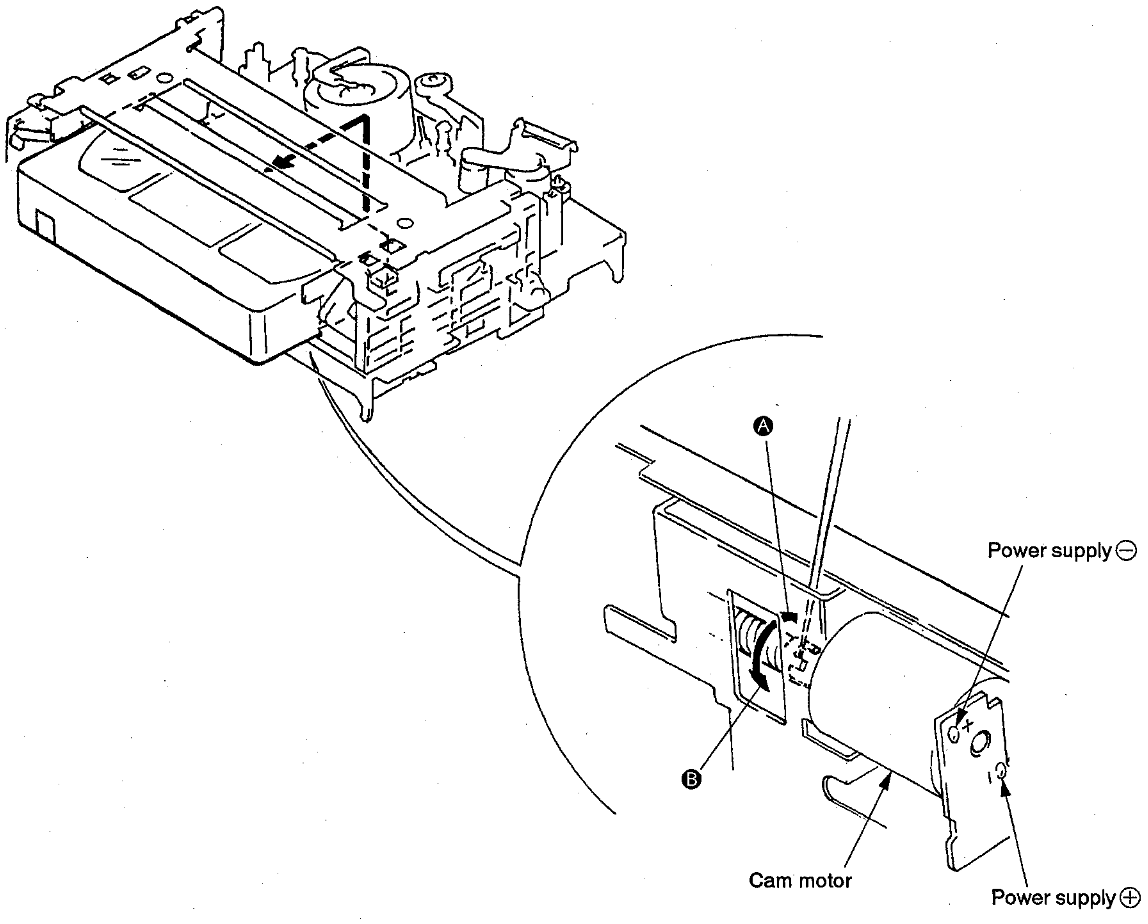


Fig. 1-2

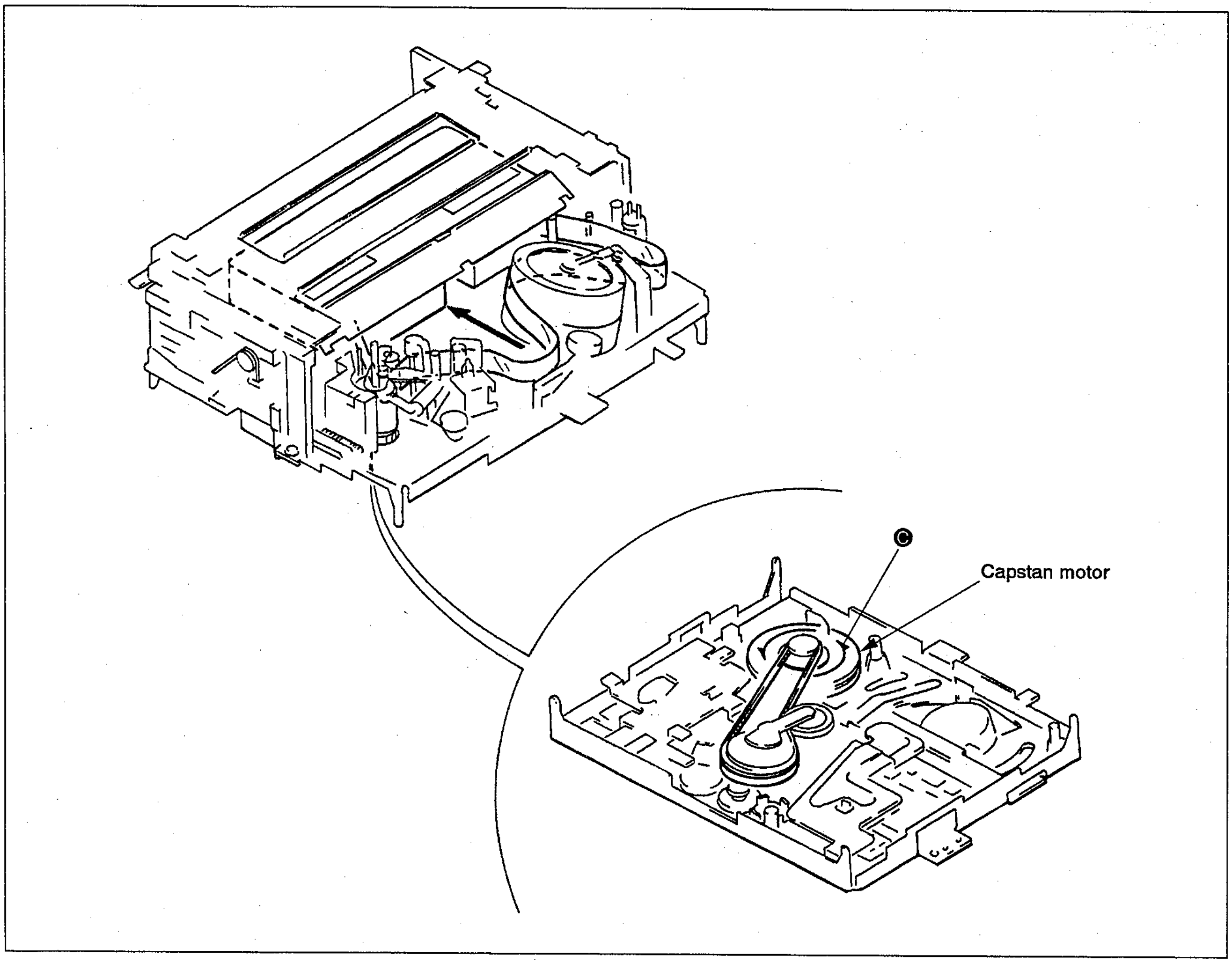

Ⓒ
Capstan motor

Fig. 1-3

1-3. HOW TO COMPLETE THREADING WITHOUT CASSETTE COMPARTMENT (Fig. 1-4)

Note 1: Put the FL block assembly removed the FL top plate on the bottom not to put dust or grease the top sensor and the end sensor luminous plates or not to scratch them. (Fig. A)

1) Pull out AC plug from wall outlet.
2) Shade near the end and top sensors with a black masking tape on the like.
3) Press cassette in/rec proof switch with a tip of screwdriver or the like.
4) Connect AC plug to wall outlet.
5) Release cassette in/rec proof switch by putting off a tip of screwdriver or the like.
   (At this time, power turns on, rewind operates for 10 seconds, after that power turns off.)

Note 2: In this condition, each mode can be set to video cassette recorder. (including recording mode)
However, fast forward should be done after rewinding for 15 seconds or more.

Note 3: After above mentioned operation, be sure to return the mode in the following order.

1) Remove the tape near the end and top sensors.
2) Pull out AC plug from wall outlet to reset the system control microcomputer.

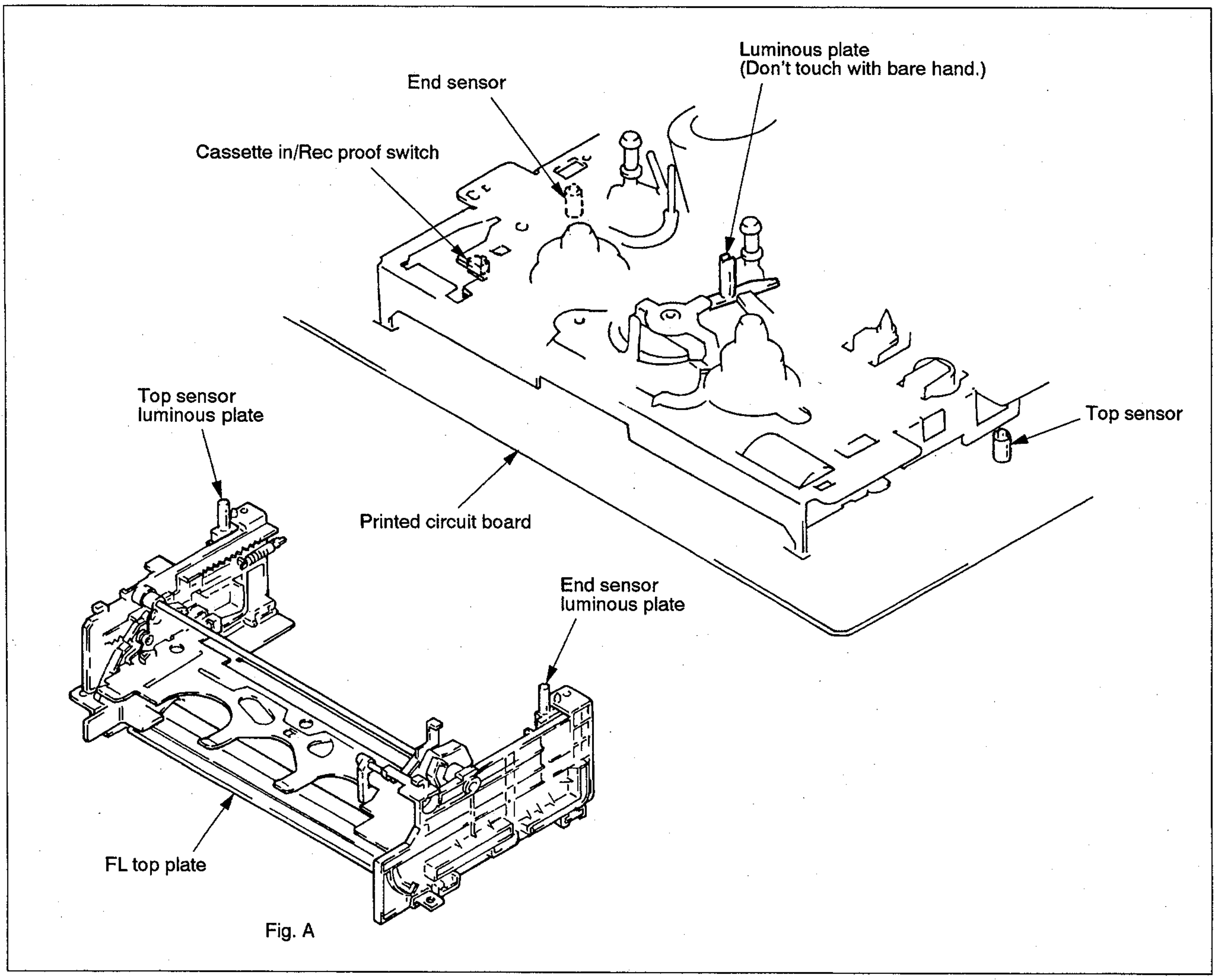

Luminous plate
(Don't touch with bare hand.)
End sensor
Cassette in/Rec proof switch
Top sensor
luminous plate
Top sensor
Printed circuit board
End sensor
luminous plate
FL top plate
Fig. A

Fig. 1-4

2. PERIODIC CHECK AND REPLACEMENT

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

* The following must be done after every repair regardless of how many hours the user has operated the machine.

2-1. CLEANING OF ROTATING HEAD DISK ASSEMBLY

1) Press a chamois cloth (Jig Ref. No. J-9) which has been dipped in cleaning fluid (Jig Ref. No. J-8) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-2. CLEANING OF THE TAPE MOVEMENT SYSTEM

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

2-3. CLEANING THE DRIVE SYSTEM

1) Clean the driving parts with a cloth that been dipped in cleaning fluid.

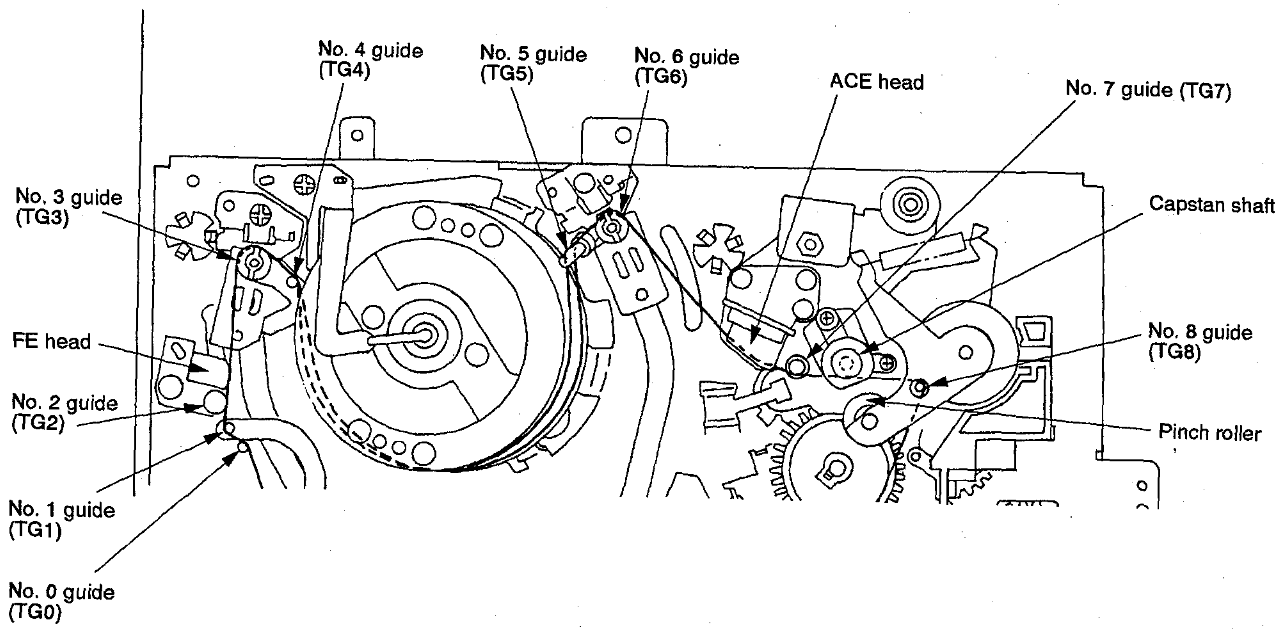

No. 4 guide (TG4)
No. 5 guide (TG5)
No. 6 guide (TG6)
ACE head
No. 7 guide (TG7)
No. 3 guide (TG3)
Capstan shaft
FE head
No. 8 guide (TG8)
No. 2 guide (TG2)
Pinch roller
No. 1 guide (TG1)
No. 0 guide (TG0)

Fig. 2-1 Parts requiring cleaning

2-4. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, according to users operating hours.

Operating Hours (H) Maintenance & Check		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Transportation System	Cleaning of tape transportation system	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE assembly	○	○	○	○	○	○	○	○	○	○	
	Cleaning & degaussing of upper drum assembly	○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Performance Confirmation	Abnormal sound	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension	–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to 4-1-1. Specified value: adjust to 36 to 44 g•cm (when measured with torque cassette tape)
	Confirmation of brake system	–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to section.
	Confirmation of record & playback functions	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 70 to 120 g•cm

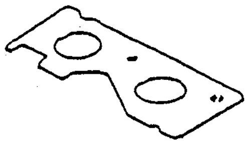
○ Cleaning ☆ Confirmation

Note: On overhaul
When overhauling the unit, replace parts as indicated in the above table.

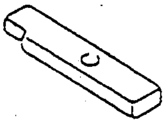
2-5. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref No.	Name	Part No.	Carved Jig No.	Remarks
J-1	Master Plane	H-7099-279-H		Applicable to S-VHS
J-2	Reel Disk Height Jig	H-7099-038-H		
J-3	Torque Gauge Adaptor	H-7099-035-H		
J-4	0.93 mm Torque Gauge	H-7099-039-H		
J-5	Hex. Wrench	H-7099-202-H		
J-6	Torque Measurement Cassette VHT-063S	J-6082-011-A		For FWD & back tension torque measurement.
	Torque Measurement Cassette VHT-404S	J-6082-012-A		For CUE and review torque measurement.
J-7	Alignment Tape JVC-MH-1 (NTSC) 24HASF-2 (NTSC Hi-Fi) JVC-MH-2 (PAL) JVC-MH-4 (SECAM)	 H-7099-046-H H-7099-153-H H-7099-052-H H-7099-053-H		
J-8	Cleaning Fluid	Y-2031-001-0	—	
J-9	Chamois Leather	2-034-697-00	—	
J-10	Head Demagnetizer	Widely available	—	Demagnetize video heads and audio heads.
J-11	Dental Mirror (With handle) Dental Mirror (Mirror)	J-6080-029-A J-6080-030-1	SL-5052	Tape path and tape traveling adjustments or checks.
J-12	FLOIL SG-055G	7-651-000-09		
J-13	Diamond Oil NT-68	7-661-018-18		
J-14	Screw Lock G (1401B)	7-432-114-11		

J-1



J-2



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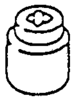

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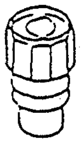
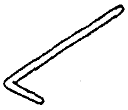
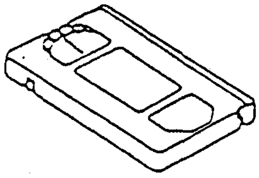


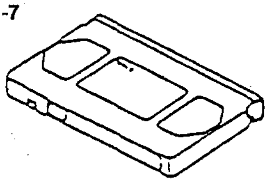
J-5



J-6

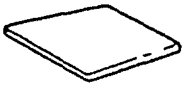


J-7

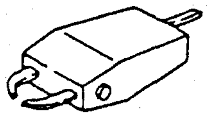


J-8

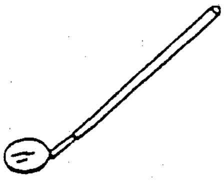
J-9



J-10



J-11



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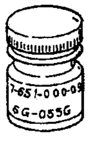
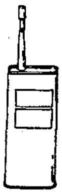


J-13

J-14



3. MAINLY MECHANICAL PARTS REPLACEMENT

Notes:

- Refer to the service manual, "DISASSEMBLY" for removal of the cabinet and boards.
- On mounting, while referring to notes on mounting perform reversely in the removal order.
- When replacing greased parts, grease them in the same way.
- Do not oil, grease or touch with bare hands the surfaces contacts tape of guides and brake shoes.
- Install gears to engage each other.
- Basically, disassembling and assembling should be done in the unthreading-end condition.

3-1. FL BLOCK ASSEMBLY (Fig. 3-1)

1) Remove screws ①.
2) Remove FL block assembly ② in the arrow 🅐 direction.

Note: Be careful not to damage claws on the bottom and front.

[Note on Mounting]

- First insert claws on the bottom and front not to damage.
- Engage FL slide plate to FL driving gear with slightly sliding FL slide plate. (Fig. A)
- Keep clean top sensor and end sensor luminous plates. (Refer to 1-3.)

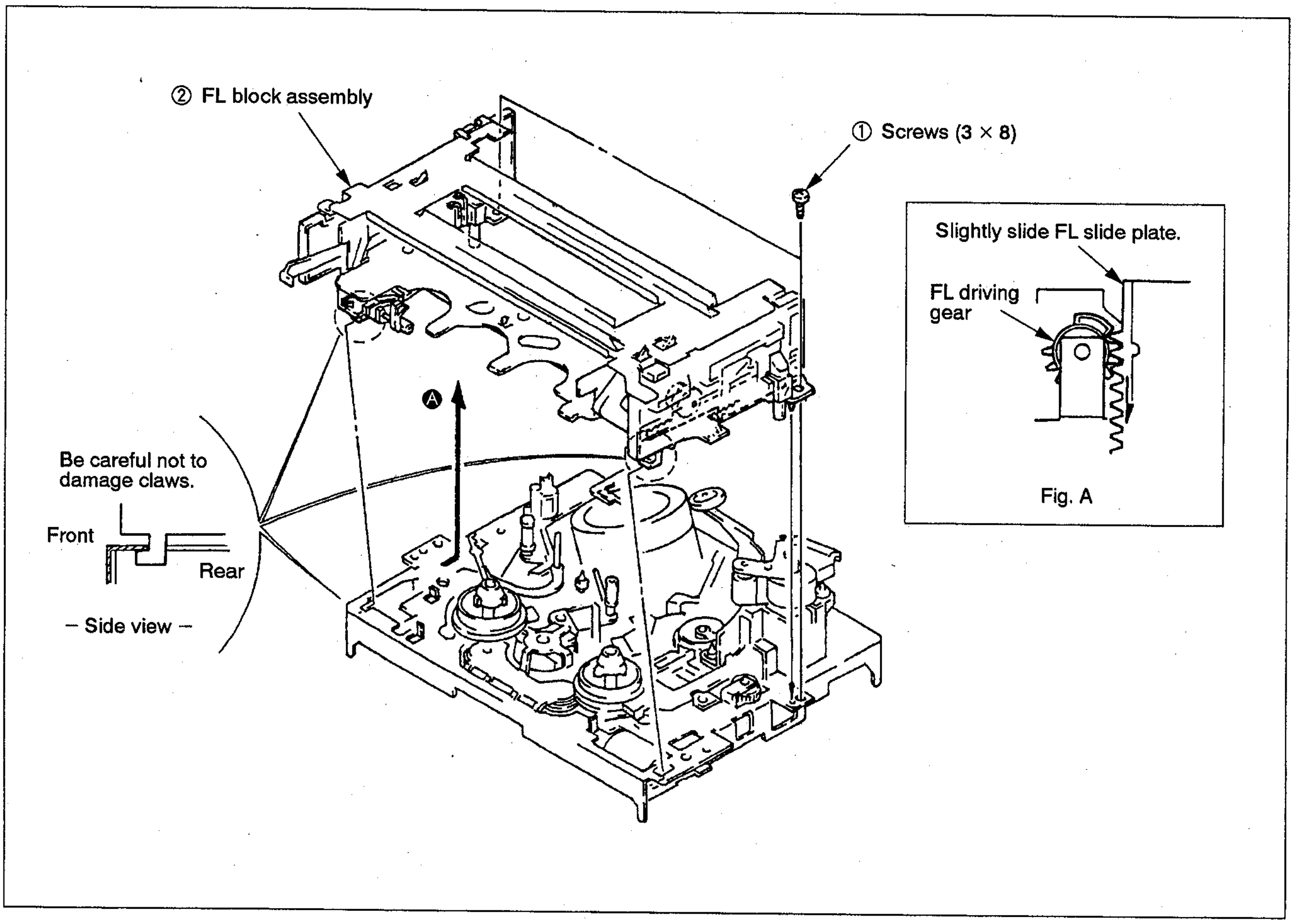

② FL block assembly
① Screws (3 × 8)
🅐
Be careful not to damage claws.
Front
Rear
– Side view –
Slightly slide FL slide plate.
FL driving gear
Fig. A

Fig. 3-1

3-2. DRUM ASSEMBLY (Fig. 3-2)

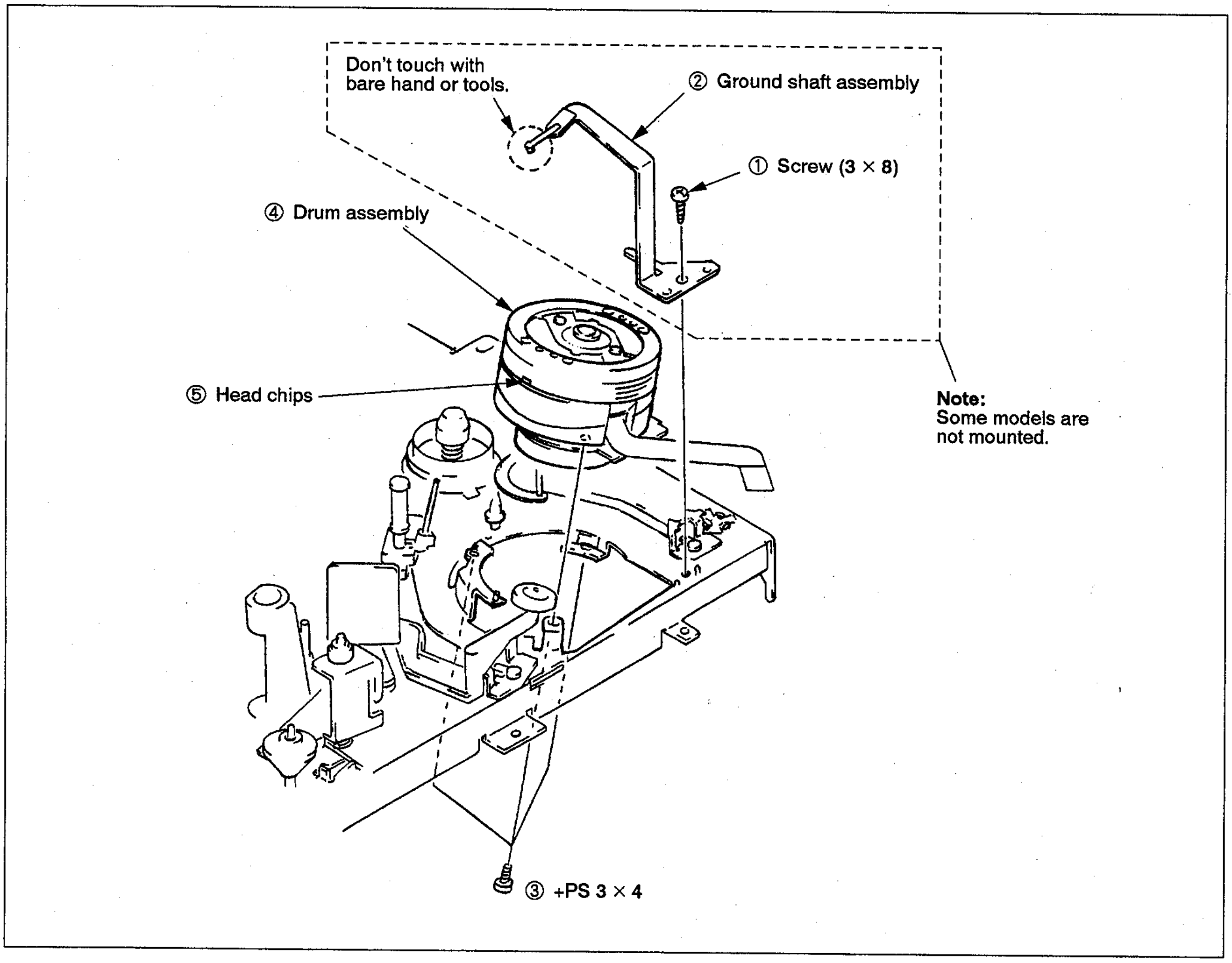
1) Remove screw ①.
2) Remove ground shaft assembly ② not to touch its tip with bare hand or tools.
3) Remove screws ③ to remove drum assembly ④.

[Note on Mounting]

- Don't touch head chips ⑤ and ground shaft assembly ④ with bare hand or tools.
- Keep clean the surface contacts tape of drum assembly ④.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.



Don't touch with bare hand or tools.
② Ground shaft assembly
① Screw (3 × 8)
④ Drum assembly
⑤ Head chips
Note:
Some models are not mounted.
③ +PS 3 × 4

Fig. 3-2

3-3. TIMING BELT (Fig. 3-3)

1) Remove screw ① to remove tension vehicle arm assembly ②.
2) Remove timing belt ③.

[Note on Mounting]

- Tighten screw ① while pressing tension vehicle arm in the arrow Ⓐ direction.

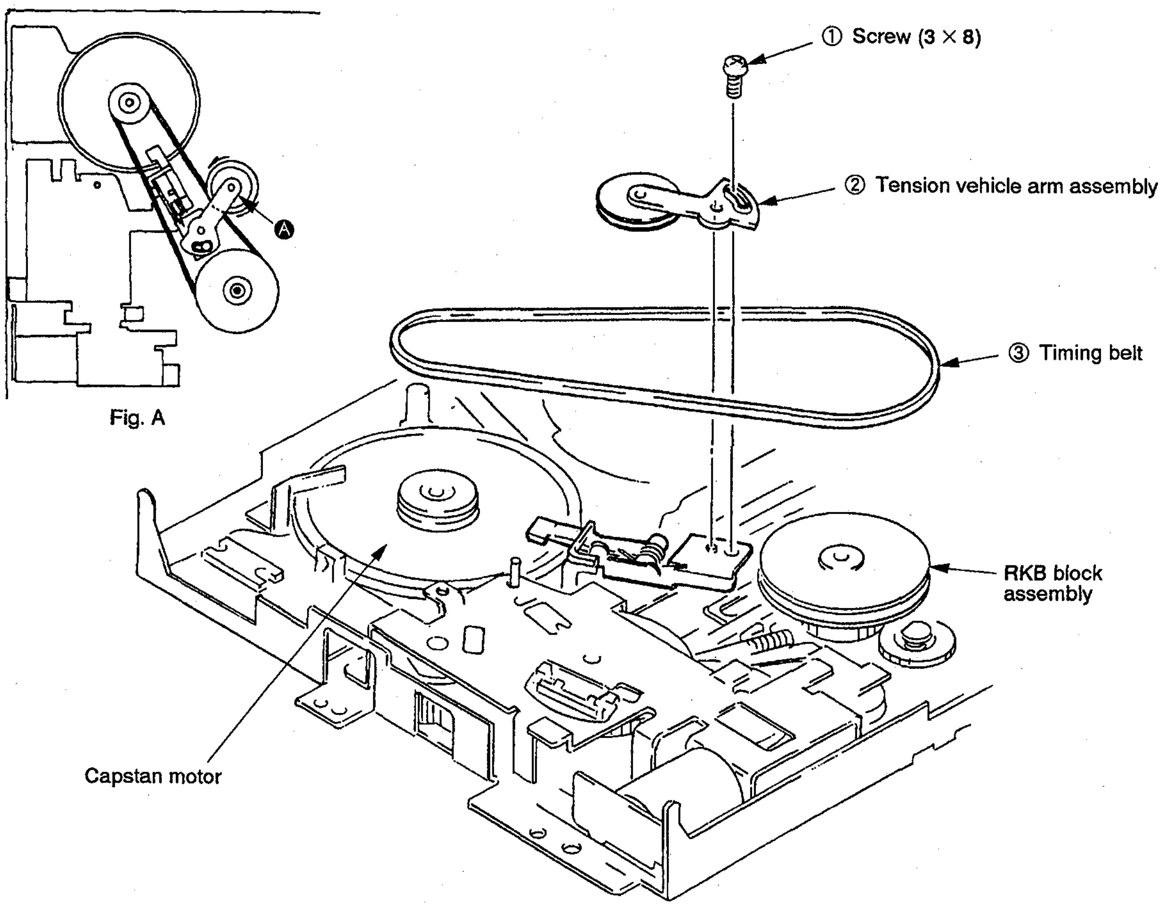

① Screw (3 × 8)
② Tension vehicle arm assembly
③ Timing belt
RKB block assembly
Capstan motor
Ⓐ
Fig. A

Fig. 3-3

3-4. CAP BRAKE ASSEMBLY (Fig. 3-4)

1) Remove tension vehicle arm assembly. (Refer to 3-3)
2) Remove torsion coil spring ① from portion Ⓐ to remove CAP brake assembly.

[Note on Mounting]

- Mount torsion coil spring ① to CAP brake assembly ② in the order Ⓐ and Ⓑ. (Fig. A)
- Put the fulcrum of CAP brake assembly ② to CAP brake shaft ③ and the tip of torsion coil spring to Ⓒ.
- Don't touch brake shoe Ⓓ with bare hand.

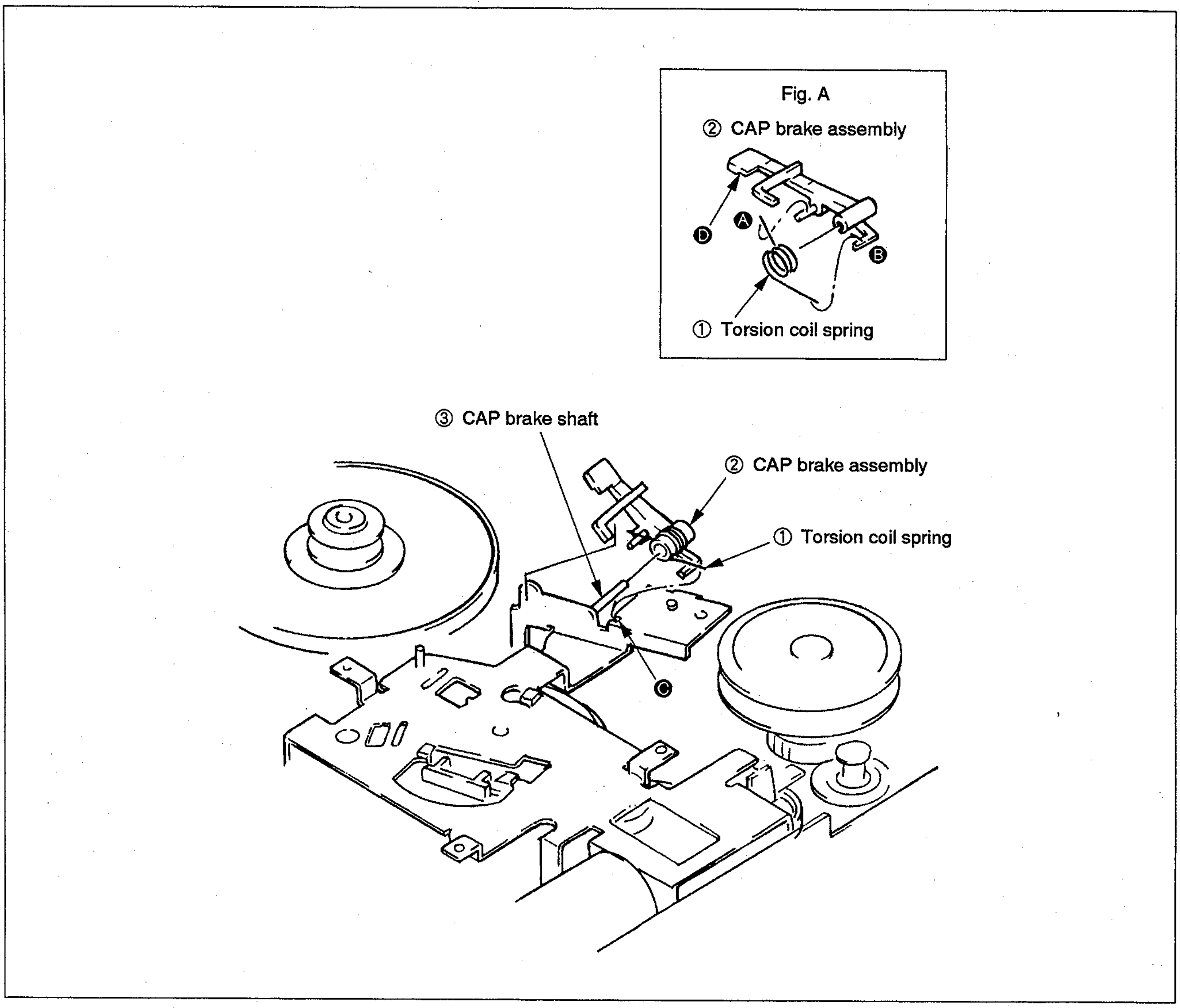


Fig. A
② CAP brake assembly
Ⓓ
Ⓐ
Ⓑ
① Torsion coil spring
③ CAP brake shaft
② CAP brake assembly
① Torsion coil spring
Ⓒ

Fig. 3-4

3-5. TG2 ROLLER, FE HEAD ASSEMBLY (Fig. 3-5)

1) Remove claw Ⓐ to pull out TG2 roller ①.
2) Remove screw ② to pull out FE head assembly.

[Note on Mounting]

- Keep clean the surface contacts tape of TG2 roller ①.

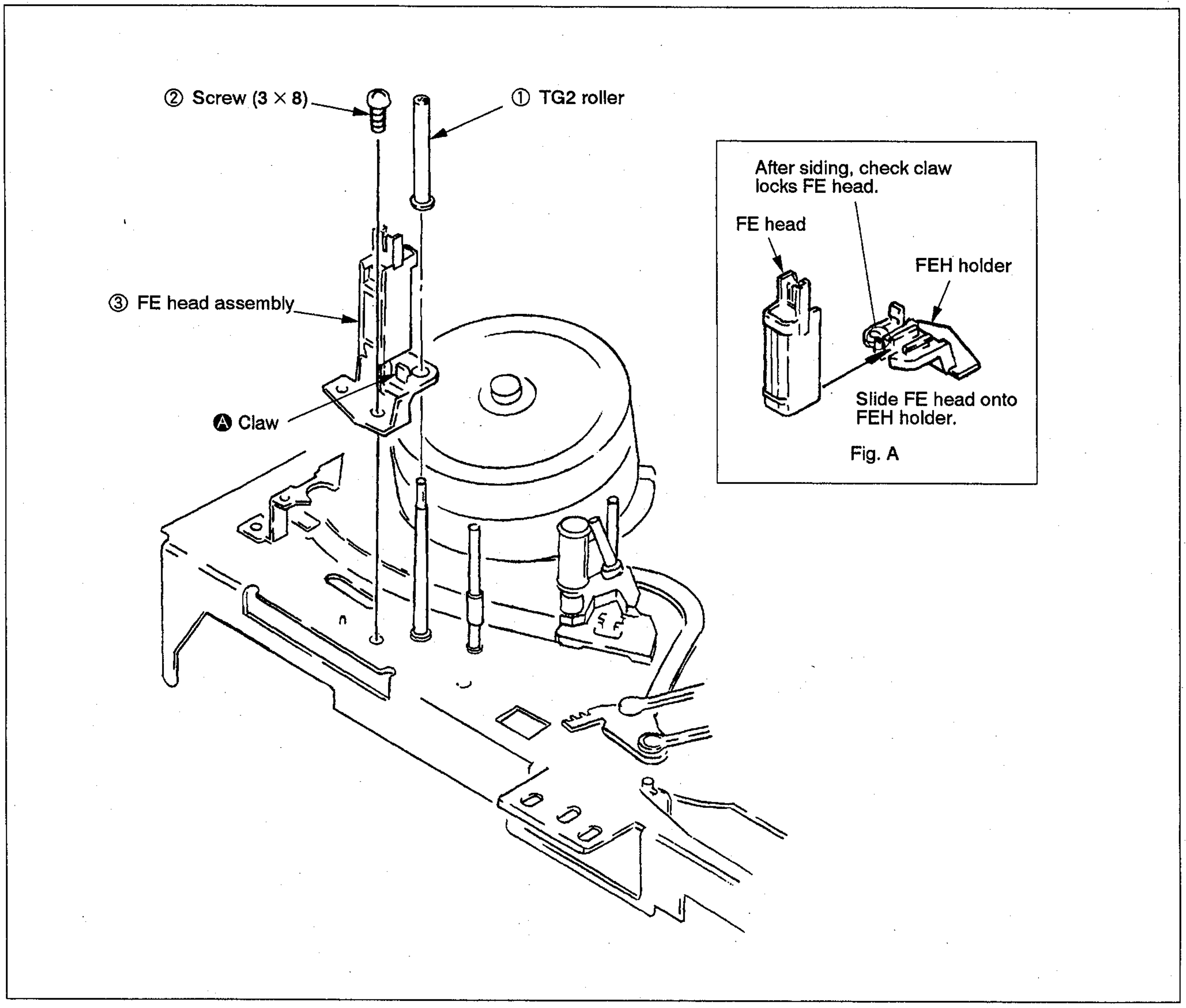

② Screw (3 × 8)
① TG2 roller
③ FE head assembly
Ⓐ Claw
After siding, check claw locks FE head.
FE head
FEH holder
Slide FE head onto FEH holder.
Fig. A

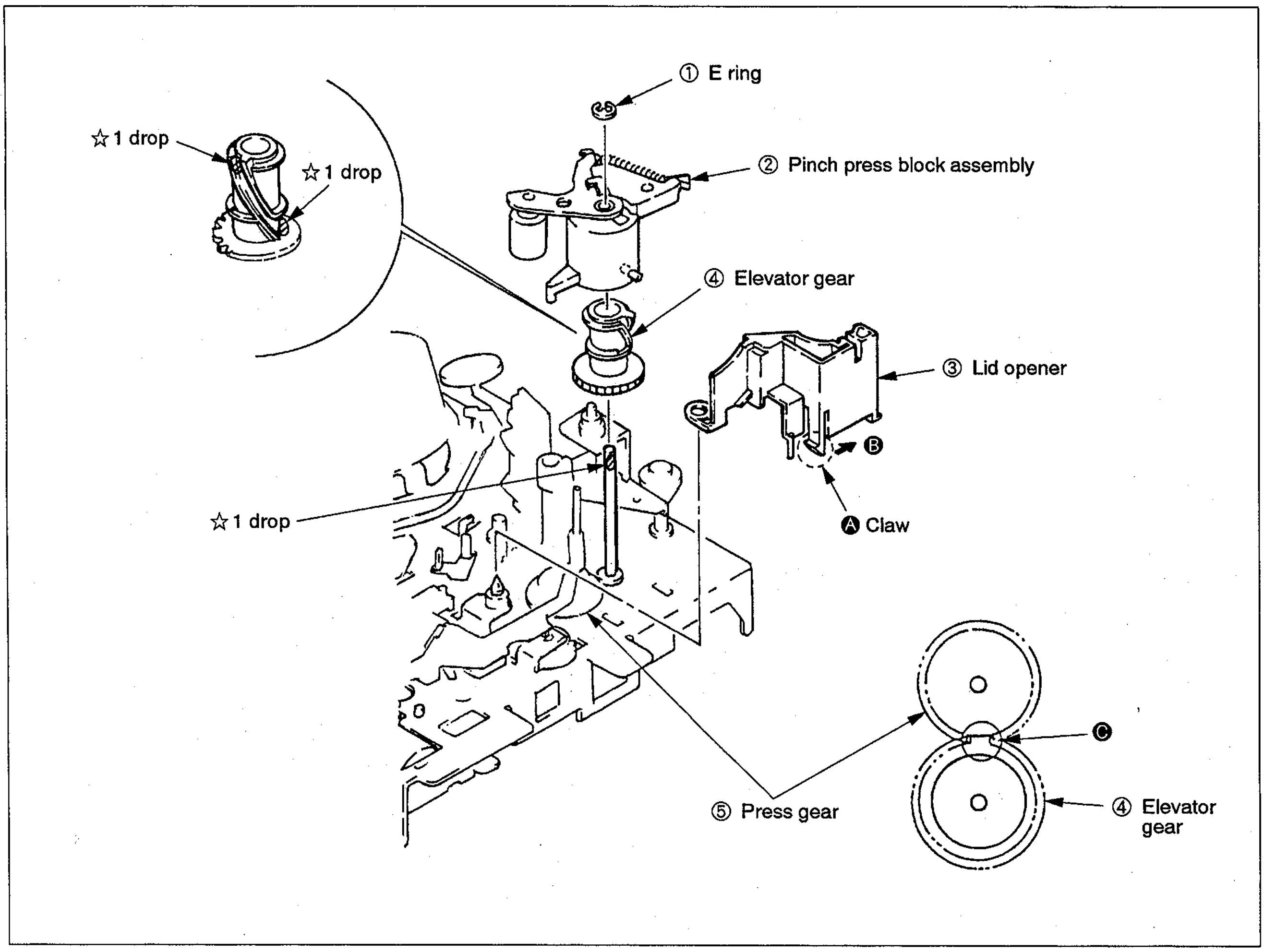
Fig. 3-5

3-6. PINCH PRESS BLOCK ASSEMBLY, ELEVATOR GEAR (Fig. 3-6)

1) Remove E ring ① to pull out pinch press block assembly ②.
2) Remove lid opener ③ by pressing claw Ⓐ in the arrow Ⓑ direction.
3) Pull out elevator gear ④.

[Note on Mounting]

- Apply grease FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions.
- Be sure to match the phase Ⓒ between elevator gear ④ and press gear ⑤ on mounting elevator gear ④.



① E ring
☆1 drop
☆1 drop
② Pinch press block assembly
④ Elevator gear
③ Lid opener
Ⓑ
☆1 drop
Ⓐ Claw
Ⓒ
⑤ Press gear
④ Elevator gear

Fig. 3-6

3-7. ACE BLOCK ASSEMBLY (Fig. 3-7)

1) Move torsion coil spring (ACE) ① in the arrow 🅐 direction.
2) Remove ACE adjustment screw ②.
3) Remove AC height adjustment nut ③ to pull out ACE block assembly ④.

[Note on Mounting]

- Keep clean the surface contacts tape of ACE block assembly ④.
- Be sure to hang torsion coil spring (ACE) ① in the arrow 🅑 direction.
- Set ACE adjustment screw ② to the height as shown in Fig. A.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.
- After adjustment apply Screw Lock G (1401B) (Jig Ref. No. J-14) at ☆ marked portion.

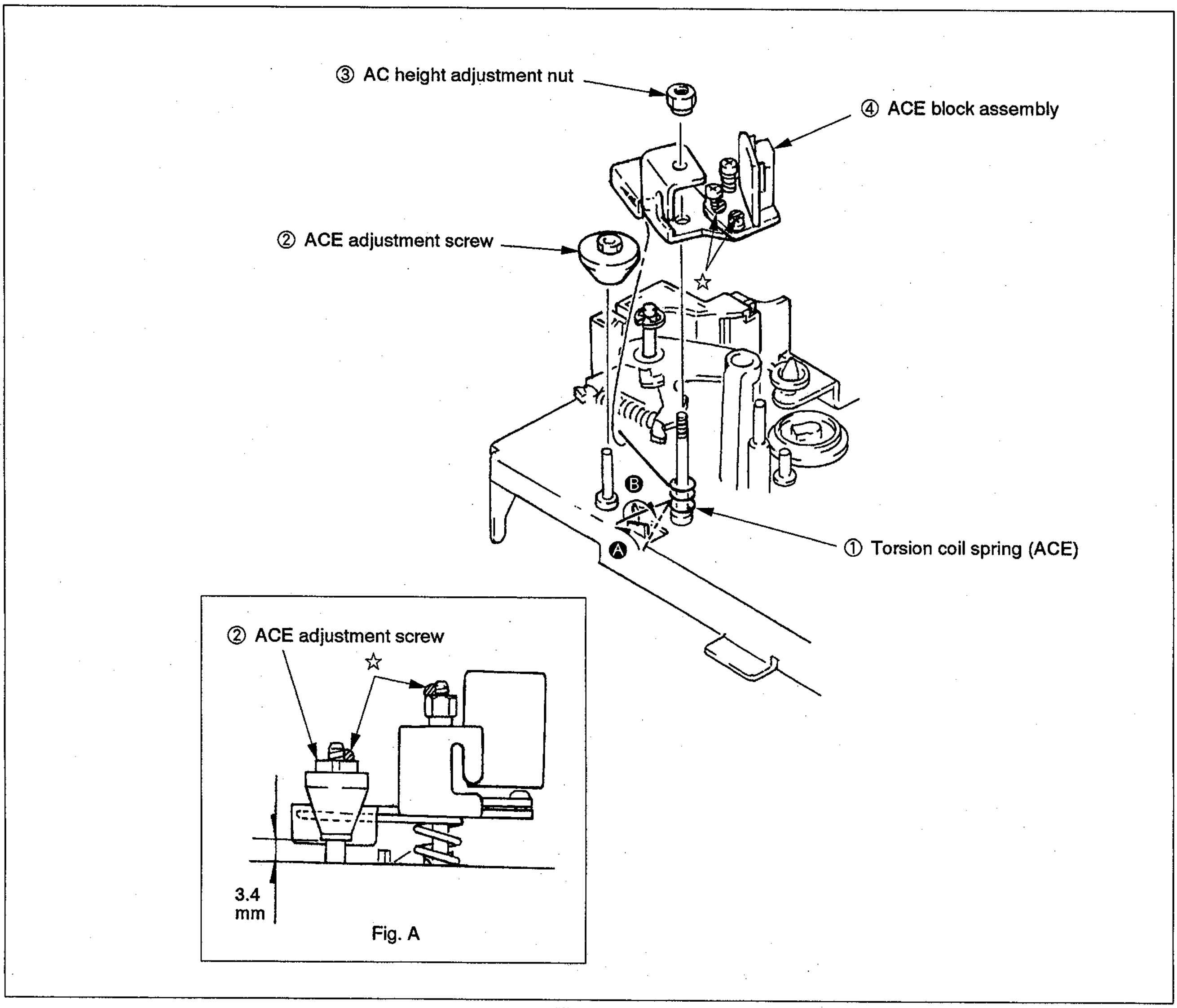

③ AC height adjustment nut
④ ACE block assembly
② ACE adjustment screw
☆
🅑
🅐
① Torsion coil spring (ACE)
② ACE adjustment screw
☆
3.4 mm
Fig. A

Fig. 3-7

3-8. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Fig. 3-8)

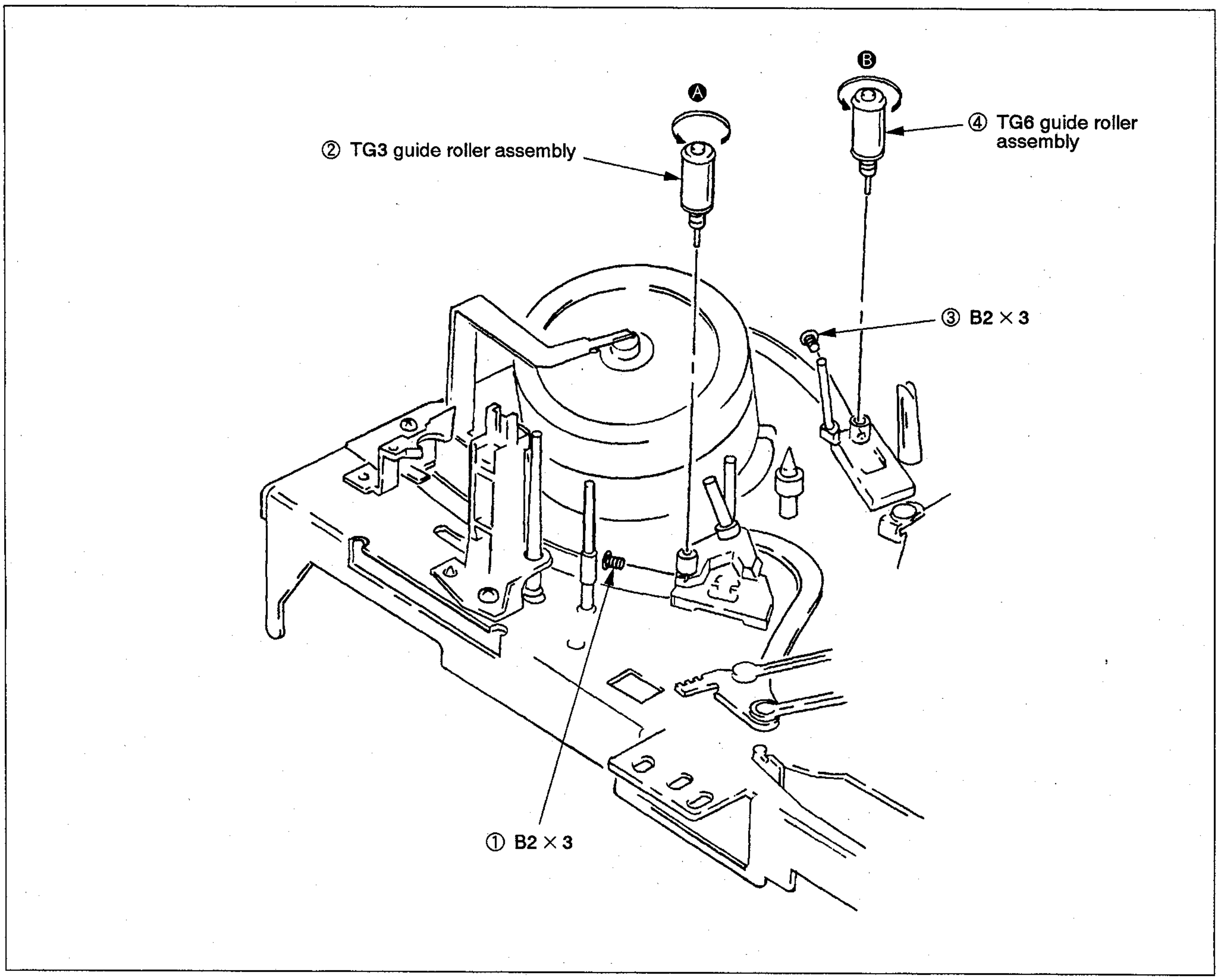
1) Loosen screw ① and pull out. TG3 guide roller assembly ② by turning it in the arrow Ⓐ direction.
2) Loosen screw ③ and pull out TG6 guide roller assembly ④ by turning it in the arrow Ⓑ direction.

[Note on Mounting]

- Keep clean the surface contacts tape of TG3 and TG6 guide roller assemblies ②, ④.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.



Ⓑ
Ⓐ
④ TG6 guide roller assembly
② TG3 guide roller assembly
③ B2 × 3
① B2 × 3

Fig. 3-8

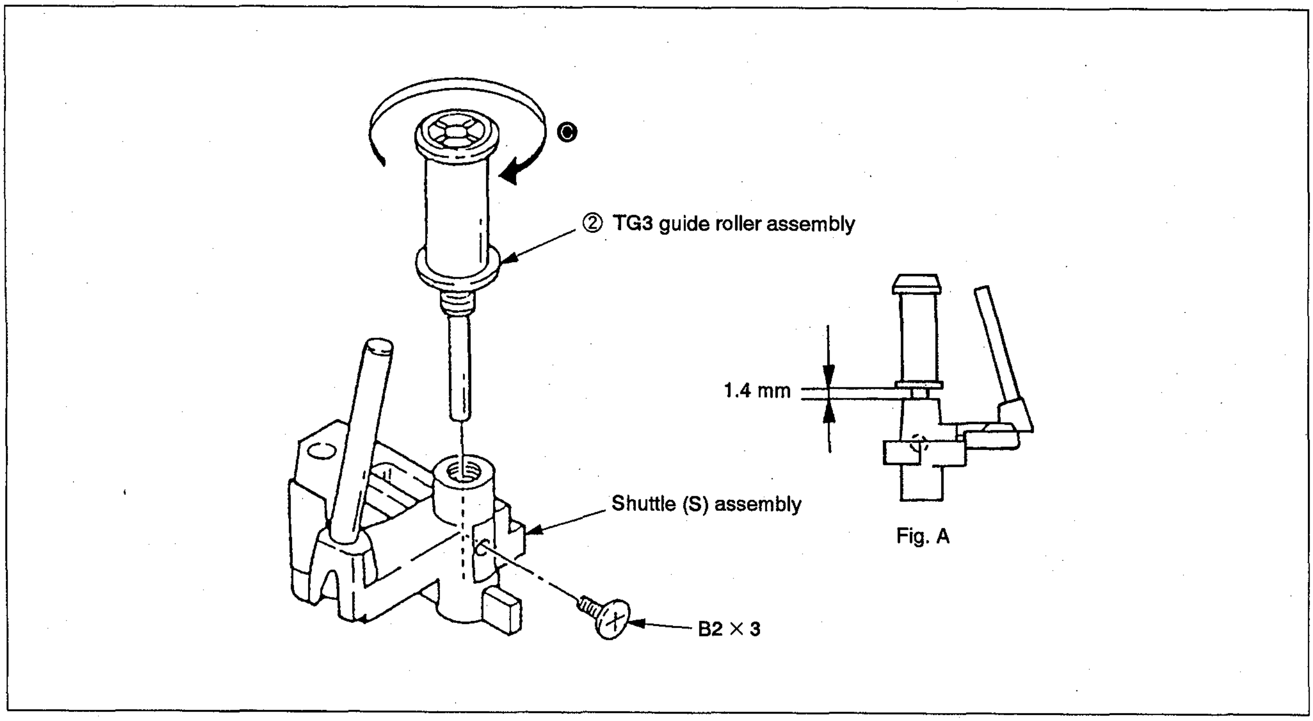

Ⓒ
② TG3 guide roller assembly
1.4 mm
Shuttle (S) assembly
Fig. A
B2 × 3

Fig. 3-9

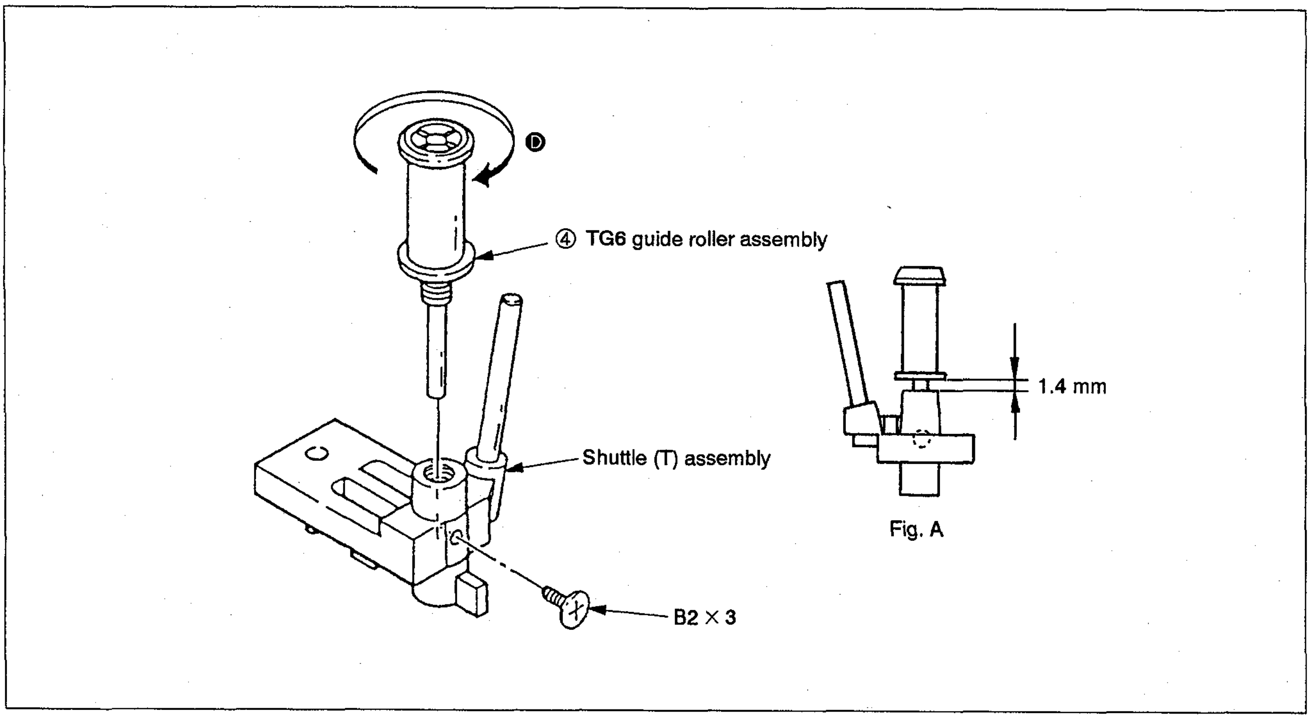

Ⓓ
④ TG6 guide roller assembly
1.4 mm
Shuttle (T) assembly
Fig. A
B2 × 3

Fig. 3-10

3-9. CAPSTAN MOTOR (Fig. 3-11)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove screws ① to pull out capstan motor ②.

[Note on Mounting]

- Keep clean the surface contacts tape of capstan motor ②.
- On tightening screws ①, first tighten screw A temporarily, next tighten screws in the order B to C to A.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

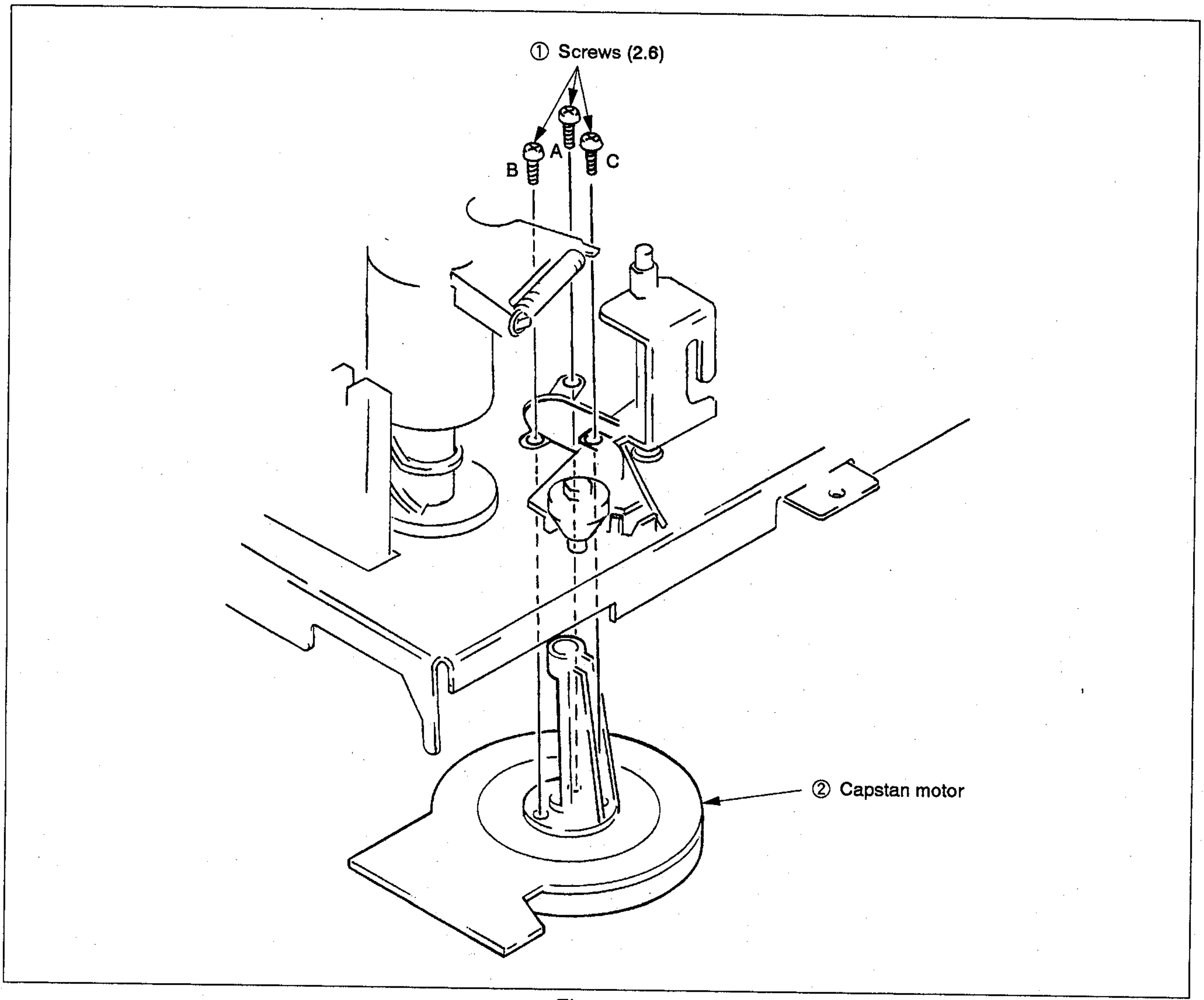


Fig. 3-11

3-10. MAIN BRAKE ASSEMBLIES S AND T (Fig. 3-12)

1) Remove tension spring ①.
2) Remove stopper washer (2) ② to remove neutrality arm ③.
3) Remove pendulum compulsion arm ④ and tension coil spring ⑤.
4) Remove stopper washer (2) ⑥ to remove main brake S assembly ⑦.
5) Remove stopper washer (2) ⑧ to remove main brake T assembly ⑨.

[Note on Mounting]

- Don't touch brake shoes Ⓐ and Ⓑ with bare hand.
- Apply FLOIL FG-055G (Jig Ref. No. J-12) to ☆ marked portions.

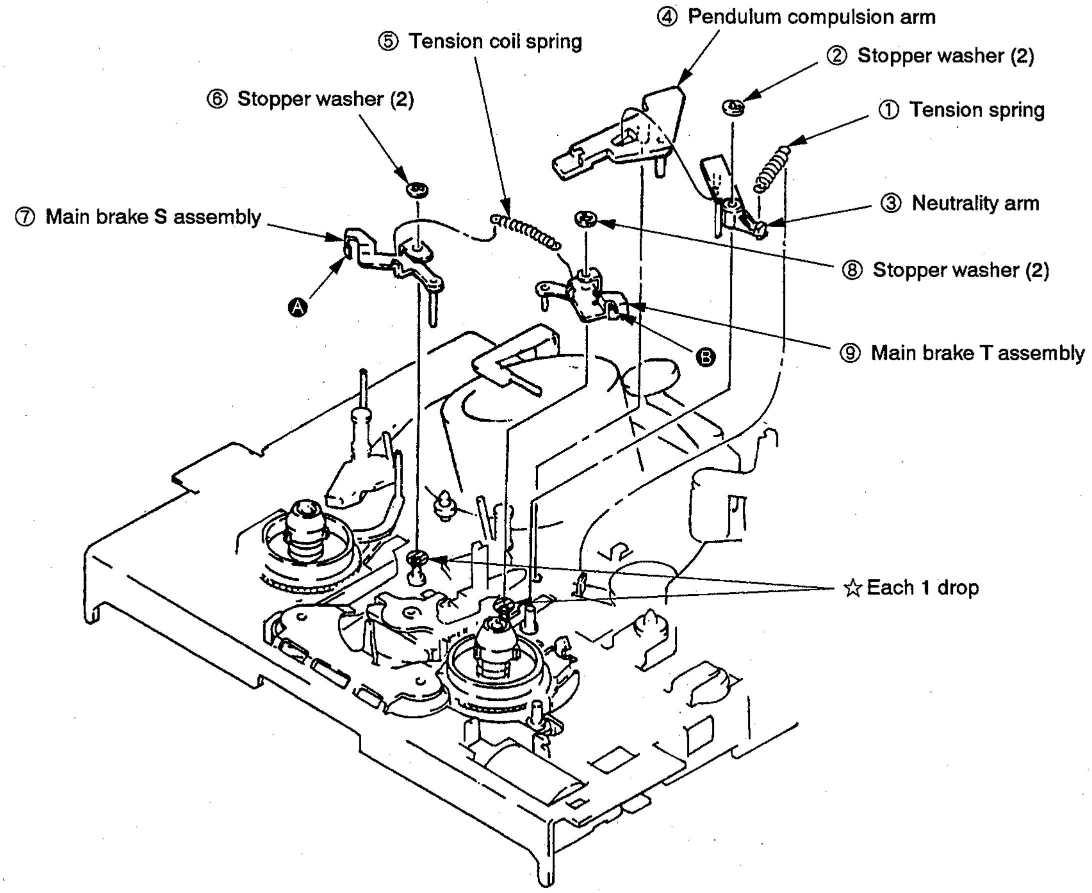

④ Pendulum compulsion arm
⑤ Tension coil spring
② Stopper washer (2)
⑥ Stopper washer (2)
① Tension spring
③ Neutrality arm
⑦ Main brake S assembly
Ⓐ
⑧ Stopper washer (2)
Ⓑ
⑨ Main brake T assembly
☆Each 1 drop

Fig. 3-12

3-11. SOFT BRAKE T ASSEMBLY (Fig. 3-13)

1) Remove pinch press block assembly. (Refer to 3-6.)
2) Remove lid opener ① carefully not to damage claw Ⓐ.
3) Remove tension spring ② from side Ⓑ to pull out soft brake T assembly ③.

[Note on Mounting]

- Don't touch brake shoes Ⓒ with bare hand.

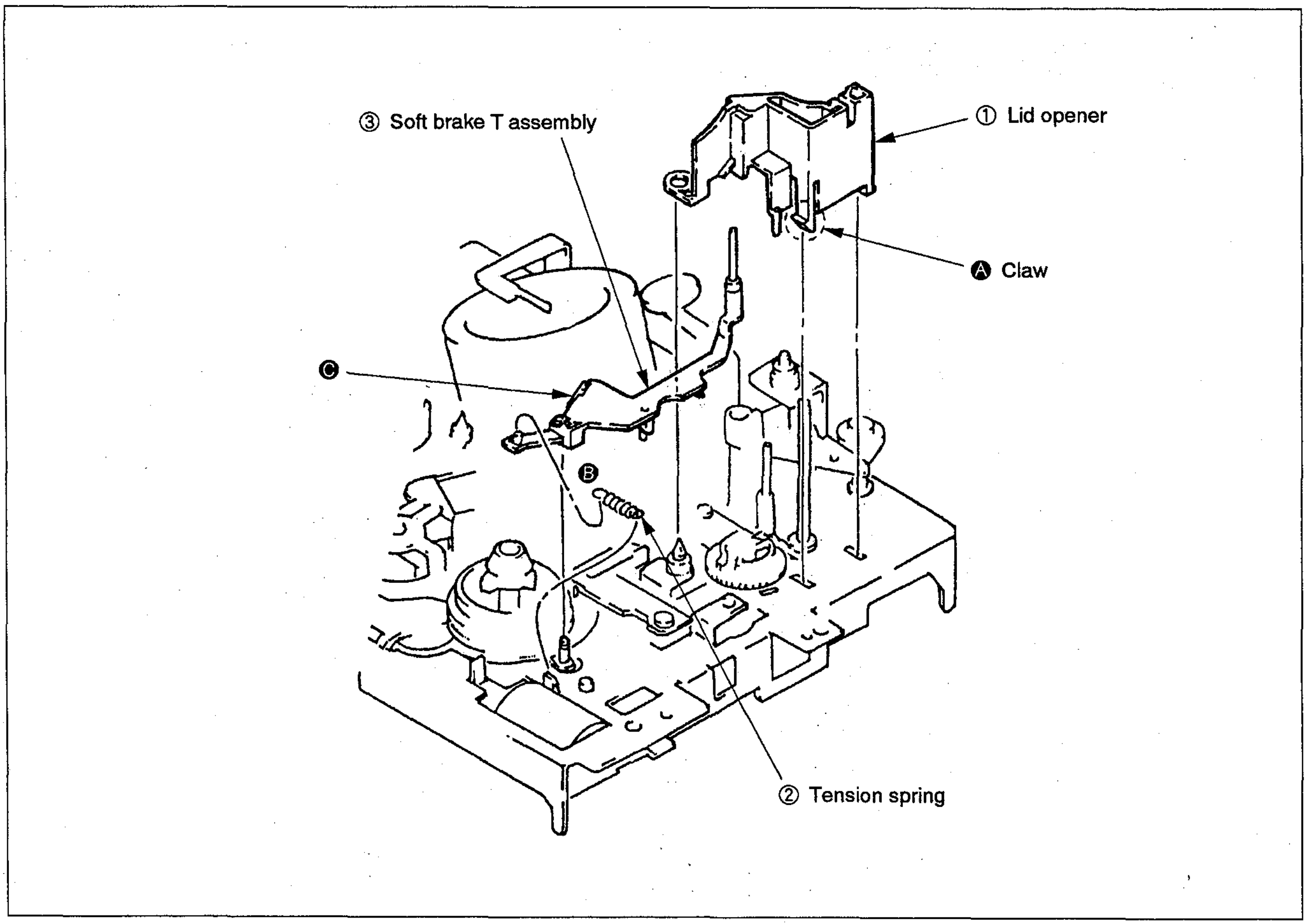

③ Soft brake T assembly
① Lid opener
Ⓐ Claw
Ⓒ
Ⓑ
② Tension spring

Fig. 3-13

3-12. RVS BRAKE ARM ASSEMBLY, REEL TABLE (T) ASSEMBLY (Fig. 3-14)

1) Remove main brake T assembly. (Refer to 3-10.)
2) Remove soft brake T assembly. (Refer to 3-11.)
3) Remove tension coil spring ① in the order Ⓐ to Ⓑ.
4) Remove RVS brake arm assembly ②.
5) Remove stopper washer (2) ③ to pull out reel table (T) assembly ④.

[Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion before mounting reel table (T) assembly ④. (Fig. A)
- Don't touch the hatched portion on reel table (T) assembly ④ and brake shoe Ⓒ of RVS brake arm assembly ② with bare hand.

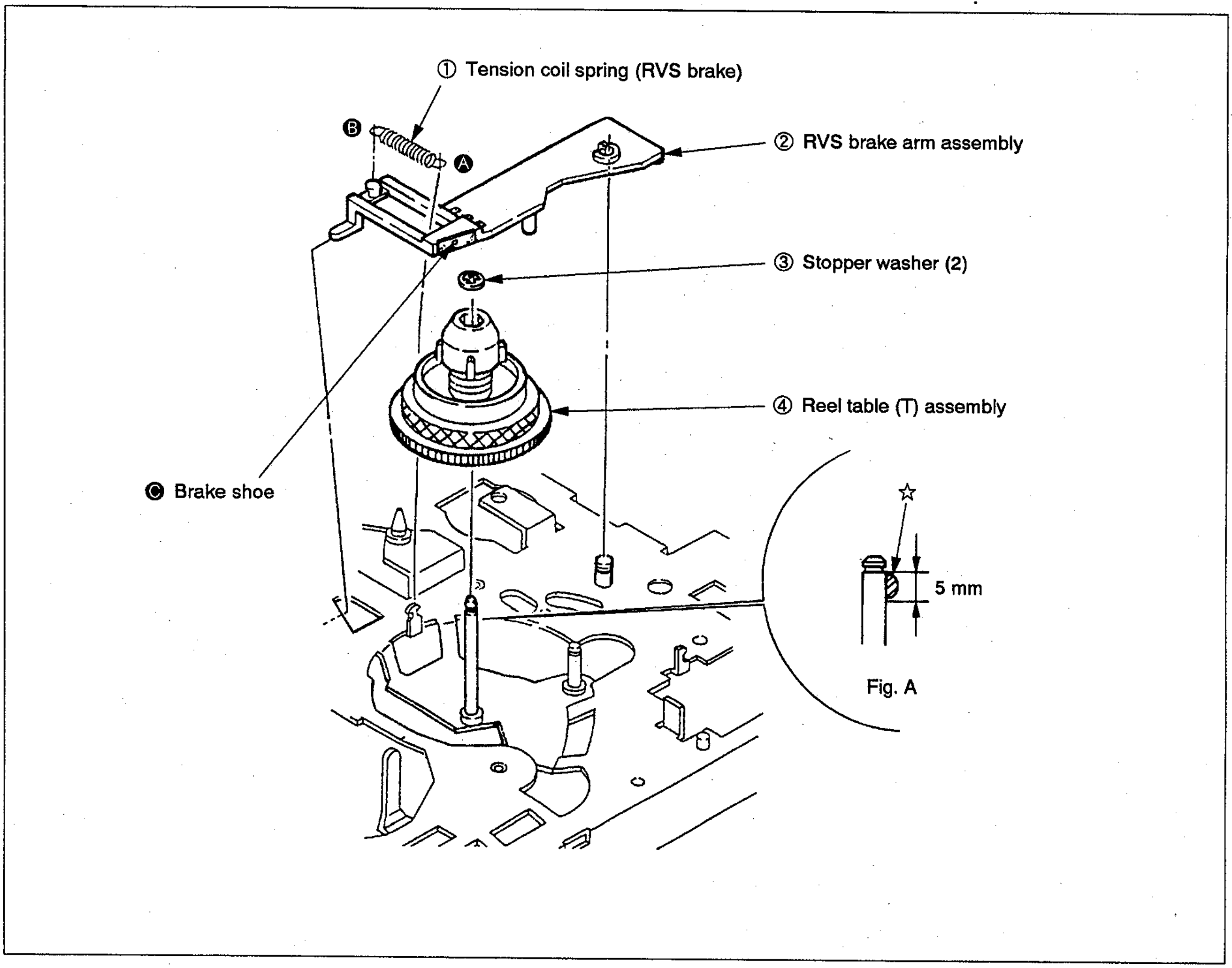

① Tension coil spring (RVS brake)
Ⓑ
Ⓐ
② RVS brake arm assembly
③ Stopper washer (2)
④ Reel table (T) assembly
Ⓒ Brake shoe
☆
5 mm
Fig. A

Fig. 3-14

3-13. TG8 ASSEMBLY (Fig. 3-15)

1) Remove TG8 retainer ① to pull out TG8 assembly ②.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portion.
- Keep clean the surface contacts tape of TG8 assembly ②.
- Be careful not to change the shape of TG8 retainer ①.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

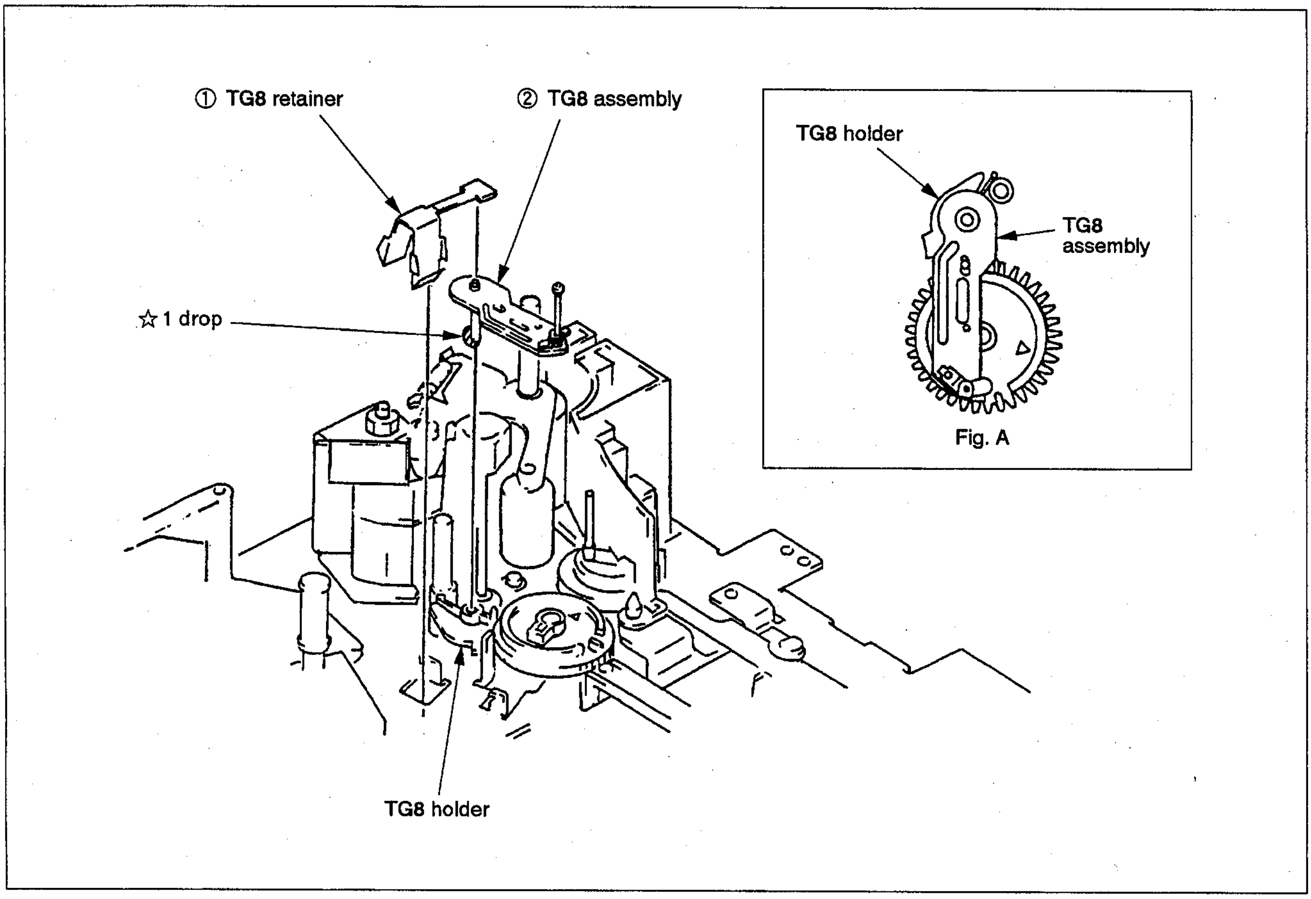

① TG8 retainer
② TG8 assembly
☆1 drop
TG8 holder
TG8 holder
TG8 assembly
Fig. A

Fig. 3-15

3-14. TG8 HOLDER (Fig. 3-16)

1) Remove TG8 assembly. (Refer to 3-13)
2) Pull out TG8 holder ①.

[Note on Mounting]

- Be careful about the direction of TG8 holder ①. (🅐 of Fig. A)

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

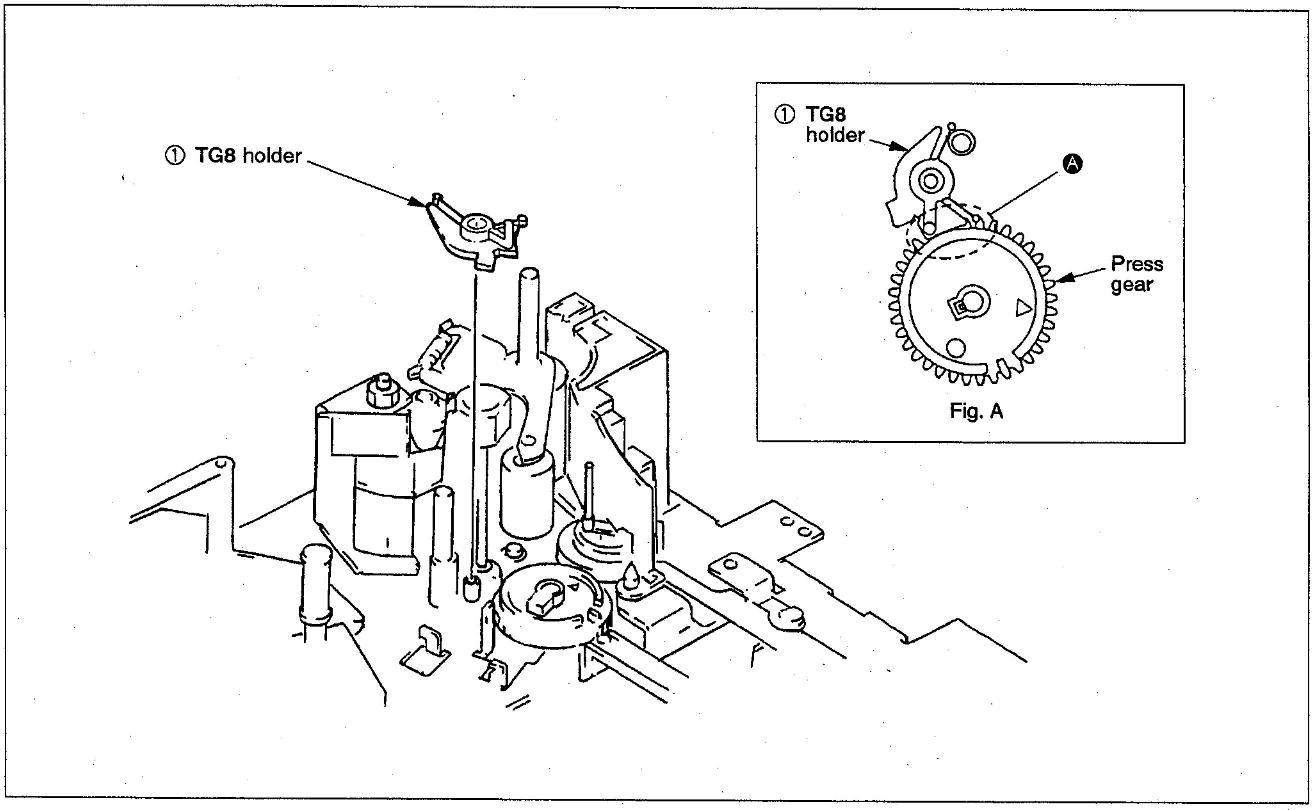

① TG8 holder
① TG8 holder
🅐
Press gear
Fig. A

Fig. 3-16

3-15. TG8 AND PRESS GEARS (Fig. 3-17)

1) Remove pinch press block assembly. (Refer to 3-6.)
2) Remove soft brake T assembly. (Refer to 3-11.)
3) Remove TG8 assembly. (Refer to 3-13.)
4) Remove TG8 holder. (Refer to 3-14.)
5) Pull out TG8 gear ① or press gear ②.

[Note on Mounting]

- Adjust the holes on gears to the holes on chassis. (Fig. A)
- Adjust the arrows carved on gears each other. (Fig. A)

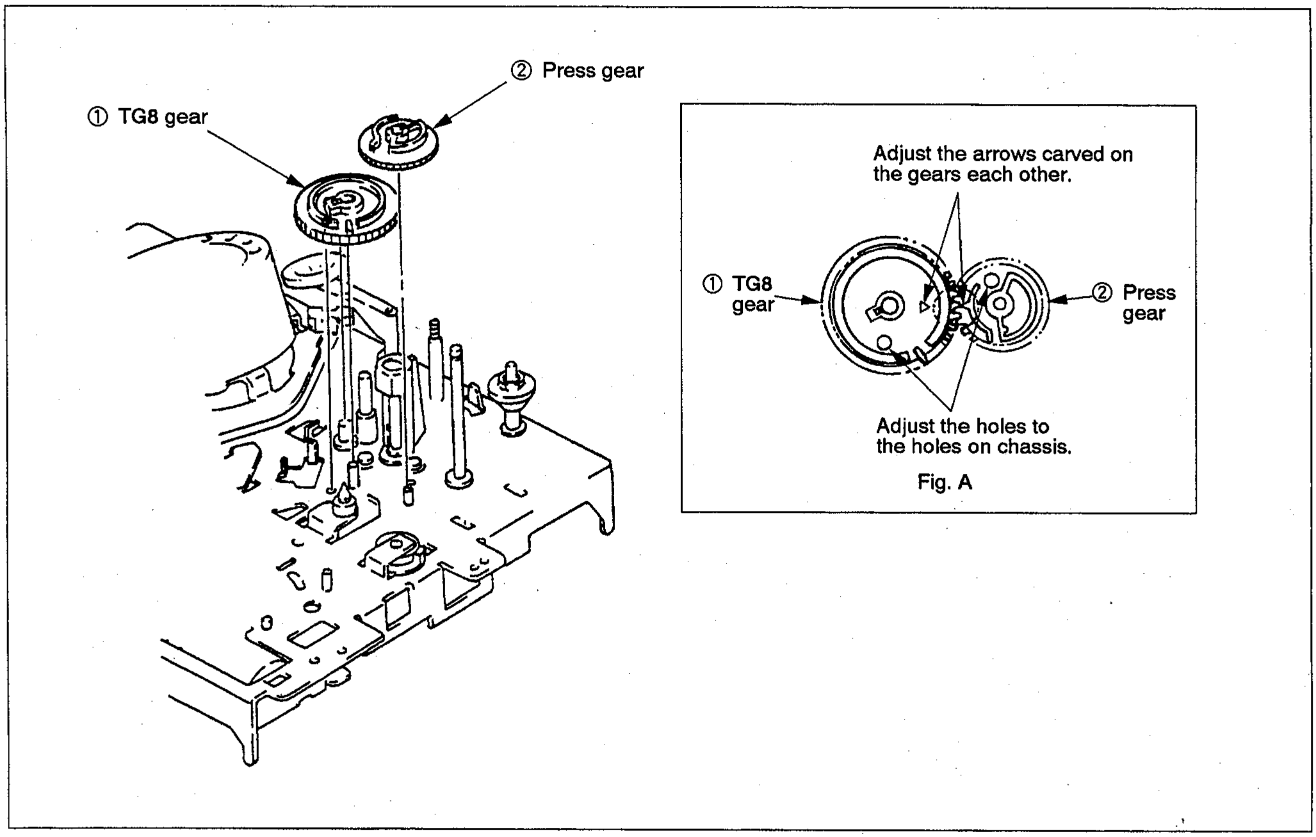

② Press gear
① TG8 gear
Adjust the arrows carved on the gears each other.
① TG8 gear
② Press gear
Adjust the holes to the holes on chassis.
Fig. A

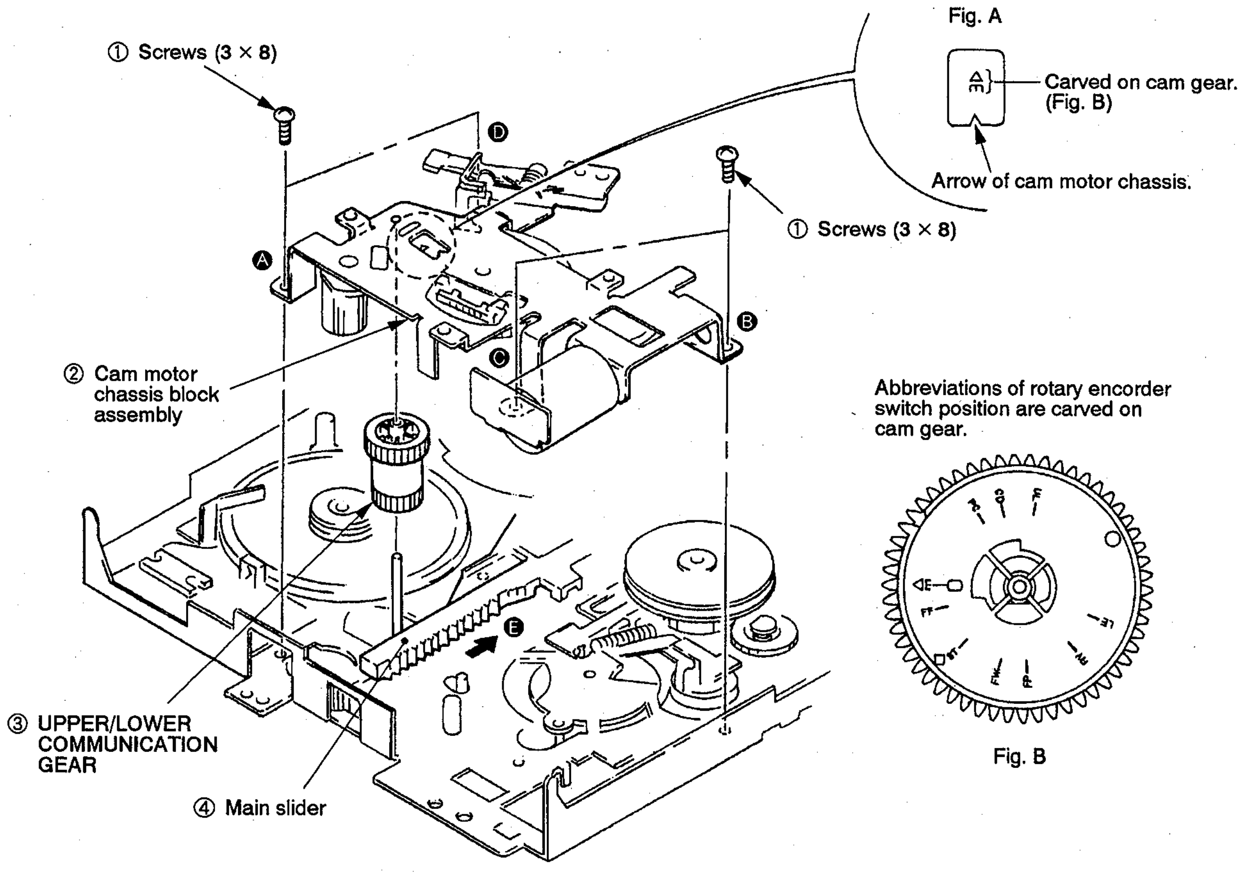
Fig. 3-17

3-16. CAM MOTOR CHASSIS BLOCK ASSEMBLY, UPPER/LOWER COMMUNICATION GEAR (Fig. 3-18)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove screws ① to remove cam motor chassis assembly ②.
4) Pull out upper/lower communication gear ③.

[Note on Mounting]

- First, check main slider ④ slides fully in the arrow 🅔 direction.
- Set rotary encoder switch position to "E" seen from the window of cam motor chassis. (Fig. A)
- Tighten screws ① in the order 🅐 to 🅑 to 🅒 to 🅓.



① Screws (3 × 8)
🅓
🅐
🅑
🅒
🅔
① Screws (3 × 8)
② Cam motor chassis block assembly
③ UPPER/LOWER COMMUNICATION GEAR
④ Main slider
Fig. A
Carved on cam gear. (Fig. B)
Arrow of cam motor chassis.
Abbreviations of rotary encorder switch position are carved on cam gear.
E
FF
Fig. B

Fig. 3-18

3-17. ROTARY ENCODER SWITCH (Fig. 3-19)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly (Refer to 3-15.) and turn upside on the bottom.
4) Remove stopper washer (2) ① to pull out worm wheel ②.
5) Remove stopper washer (2) ③ to pull out cam gear ④.
6) Pull out FL driving gear ⑤ and rotary encoder switch ⑥.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions. (Fig. 3-19, A)
- Adjust the hole 🅐 to the hole on cam motor chassis. (Fig. B)
- Adjust the holes 🅑 and 🅒 to the hole on cam motor chassis. (Fig. C)

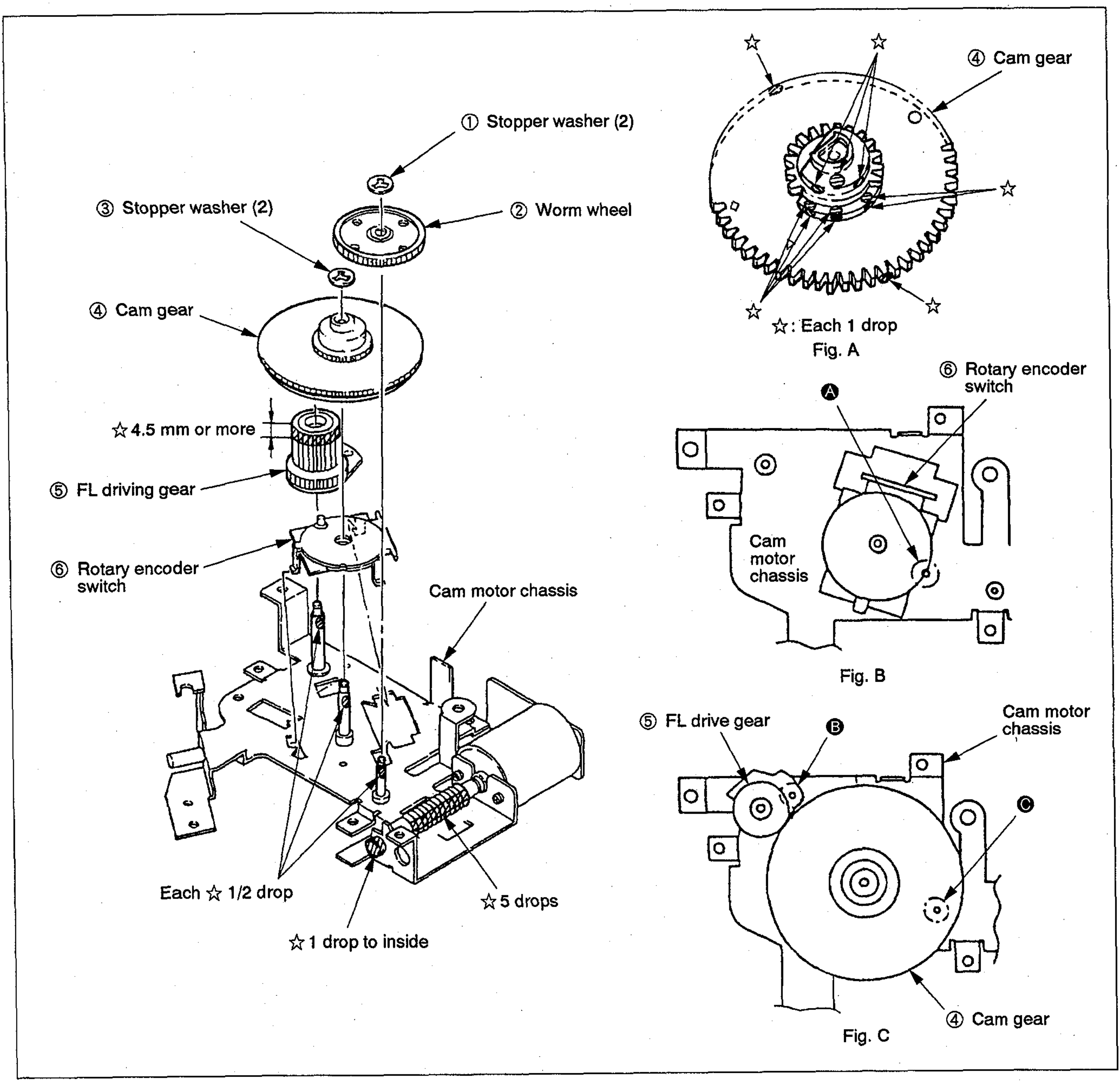

① Stopper washer (2)
③ Stopper washer (2)
② Worm wheel
④ Cam gear
☆4.5 mm or more
⑤ FL driving gear
⑥ Rotary encoder switch
Cam motor chassis
Each ☆ 1/2 drop
☆5 drops
☆1 drop to inside
☆
④ Cam gear
☆: Each 1 drop
Fig. A
⑥ Rotary encoder switch
🅐
Cam motor chassis
Fig. B
⑤ FL drive gear
🅑
Cam motor chassis
🅒
④ Cam gear
Fig. C

Fig. 3-19

3-18. MAIN SLIDER (Fig. 3-20)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove screw ① to remove retainer ②.
5) Pull out main slider ③.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) as shown in Fig. A.
- At the last, slide main slider fully in the arrow 🅐 direction.

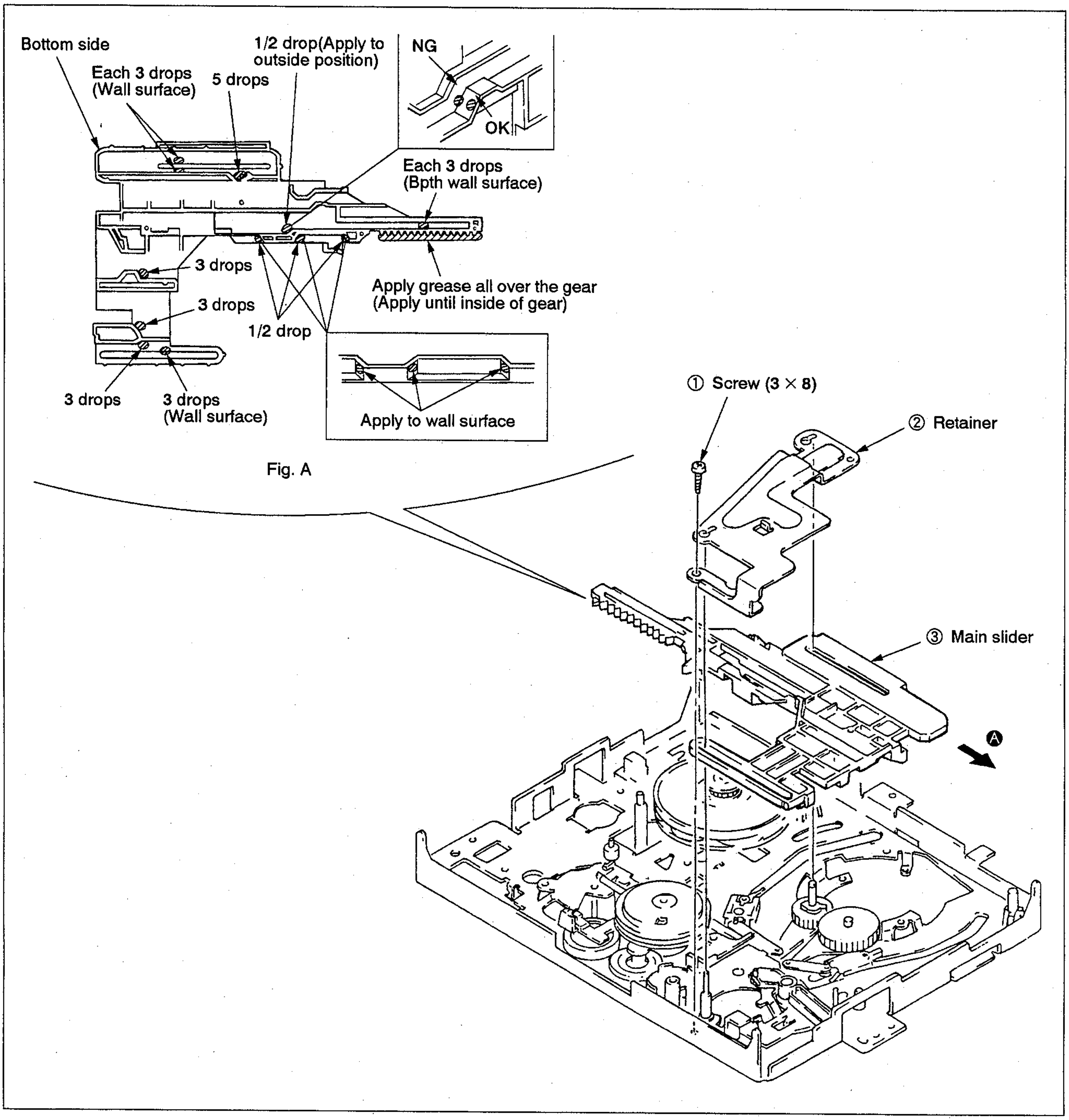

Bottom side
1/2 drop(Apply to outside position)
Each 3 drops (Wall surface)
5 drops
NG
OK
Each 3 drops (Bpth wall surface)
3 drops
3 drops
1/2 drop
Apply grease all over the gear (Apply until inside of gear)
3 drops
3 drops (Wall surface)
Apply to wall surface
① Screw (3 × 8)
② Retainer
③ Main slider
🅐

Fig. A

Fig. 3-20

3-19. SHUTTLE T BLOCK AND LOADING GEAR T BLOCK ASSEMBLIES (Fig. 3-21)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-18.)
5) Remove screw ① to remove loading leaf (T) spring ② and shuttle T block assembly ③.
6) Pull out loading gear T block assembly ④.

[Note on Mounting]

- Adjust the phase 🅐 between loading gear (T) and loading gear (S). (Fig. A)
- Keep clean the surface contacts tape of shuttle T block assembly ③.

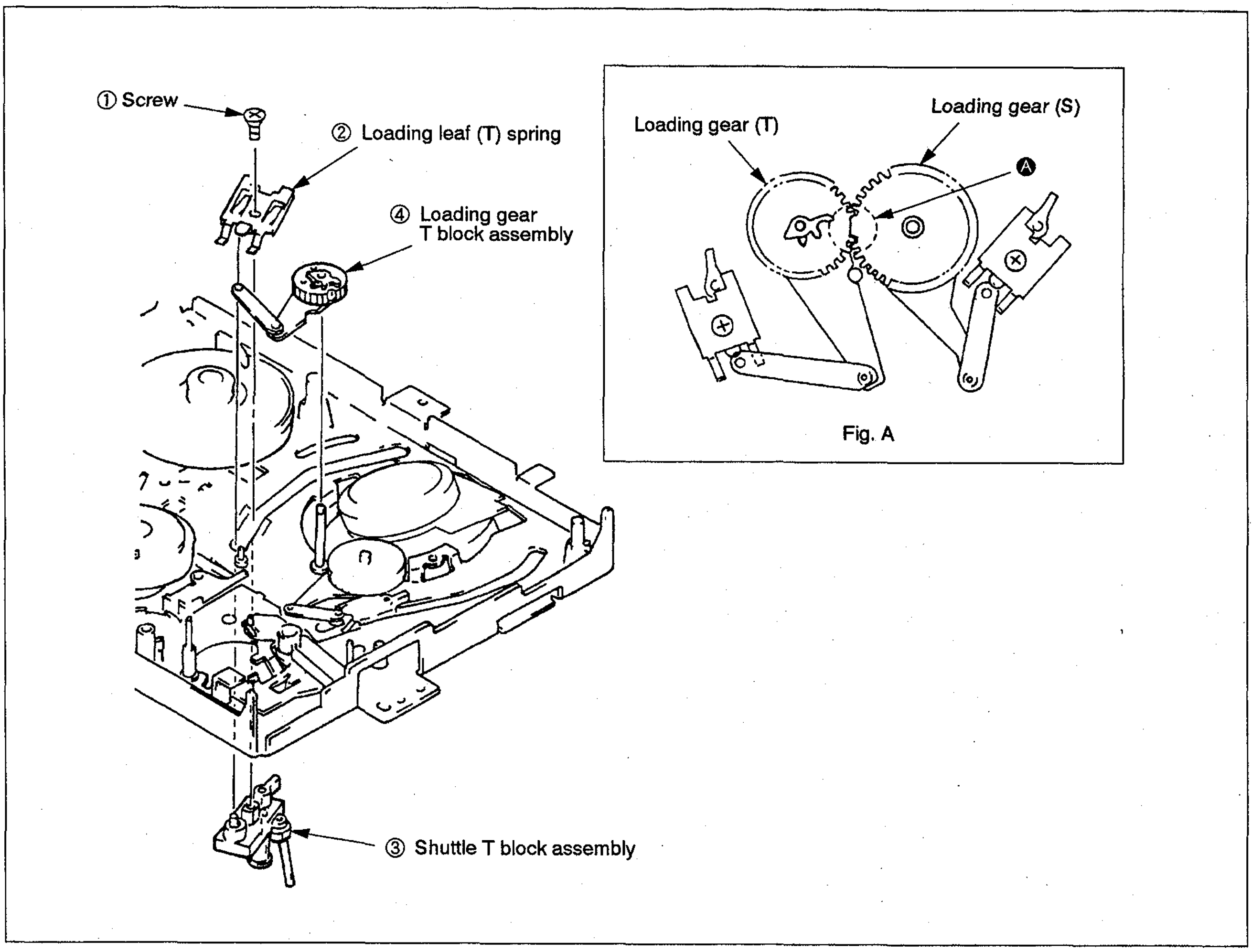

① Screw
② Loading leaf (T) spring
④ Loading gear T block assembly
③ Shuttle T block assembly
Loading gear (T)
Loading gear (S)
🅐
Fig. A

Fig. 3-21

3-20. SHUTTLE S BLOCK AND LOADING GEAR S BLOCK ASSEMBLIES (Fig. 3-22)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-15.)
5) Remove screw ① to remove loading leaf (S) spring ② and shuttle S block assembly ③.
6) Pull out loading gear S block assembly ④.

[Note on Mounting]

- Adjust the phase 🅐 between loading gear (S) and loading gear (S). (Fig. A)
- Keep clean the surface contacts tape of shuttle S block assembly ③.

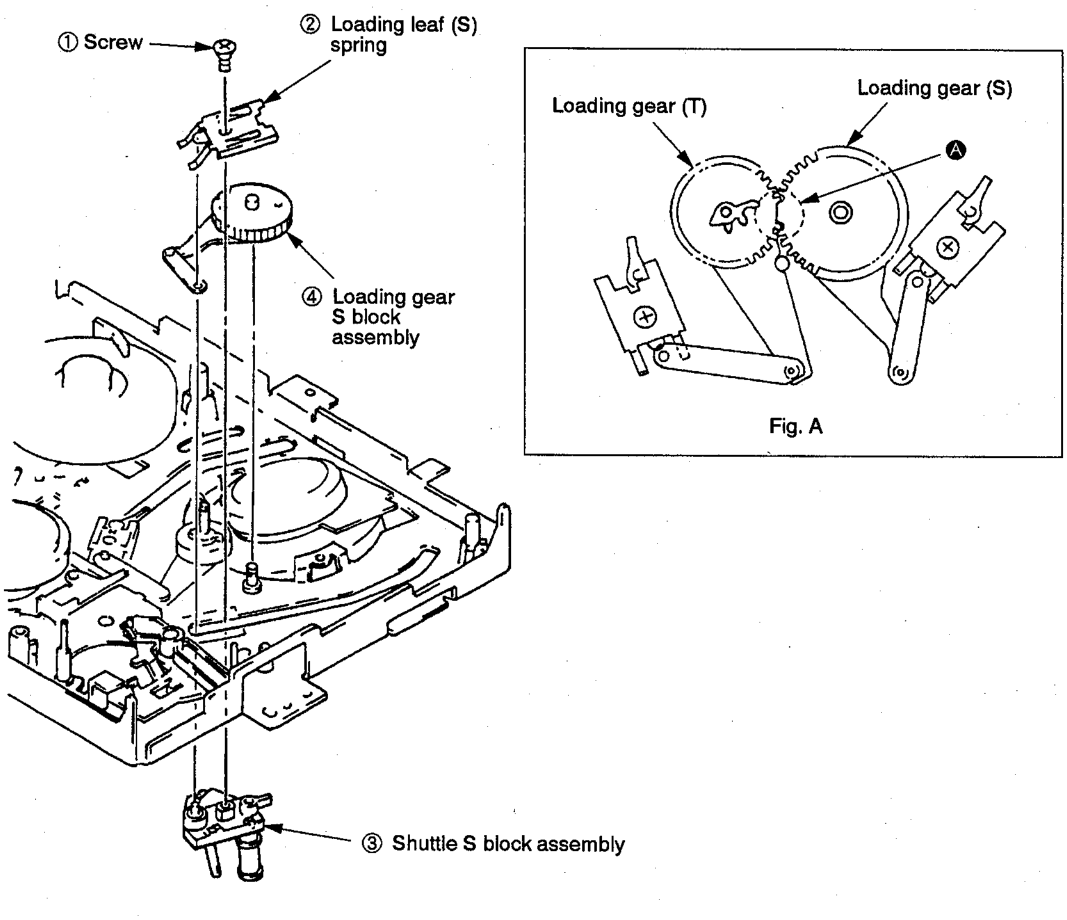

① Screw
② Loading leaf (S) spring
④ Loading gear S block assembly
③ Shuttle S block assembly
Loading gear (T)
Loading gear (S)
🅐
Fig. A

Fig. 3-22

3-21. REEL TABLE (S) ASSEMBLY (Fig. 3-23)

1) Remove tension spring ① from the chassis side.
2) Remove stopper washer (2) ② to pull out soft brake (S) ③.
3) Move TG1 band ④ over the reel table.
4) Remove stopper washer (2) ⑤.
5) While pressing main brake S assembly ⑥, pull out reel table (S) assembly ⑦.

[Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion before mounting reel table (S) assembly ⑥. (Fig. A)
- Don't touch the hatched portion on reel table (S) assembly ⑥ with bare hand.

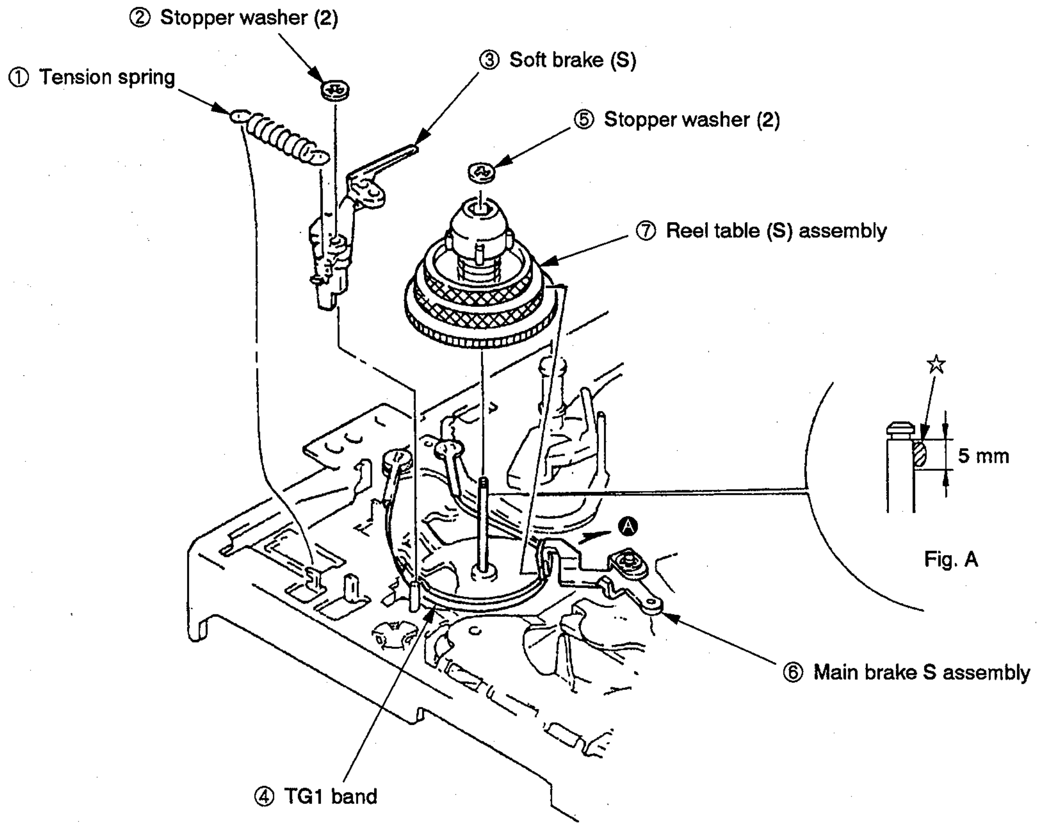

② Stopper washer (2)
① Tension spring
③ Soft brake (S)
⑤ Stopper washer (2)
⑦ Reel table (S) assembly
☆
5 mm
Fig. A
Ⓐ
⑥ Main brake S assembly
④ TG1 band

Fig. 3-23

3-22. TG1 ASSEMBLY (Fig. 3-24)

1) Set the mechanism to the loading-end condition referring to 1-1. (Cam gear indicates "LE". (Refer to Fig. A and B of Fig. 3-18.))
2) Remove tension spring ① in the order Ⓐ to Ⓑ.
3) Remove stopper washer (2) ② to pull out TG1 assembly ③.

[Note on Mounting]

- Apply one drop of Diamond Oil NT-68 (Jig Ref. No. J-13) to ☆ marked portion.
- Keep clean the felt side of TG1 assembly.

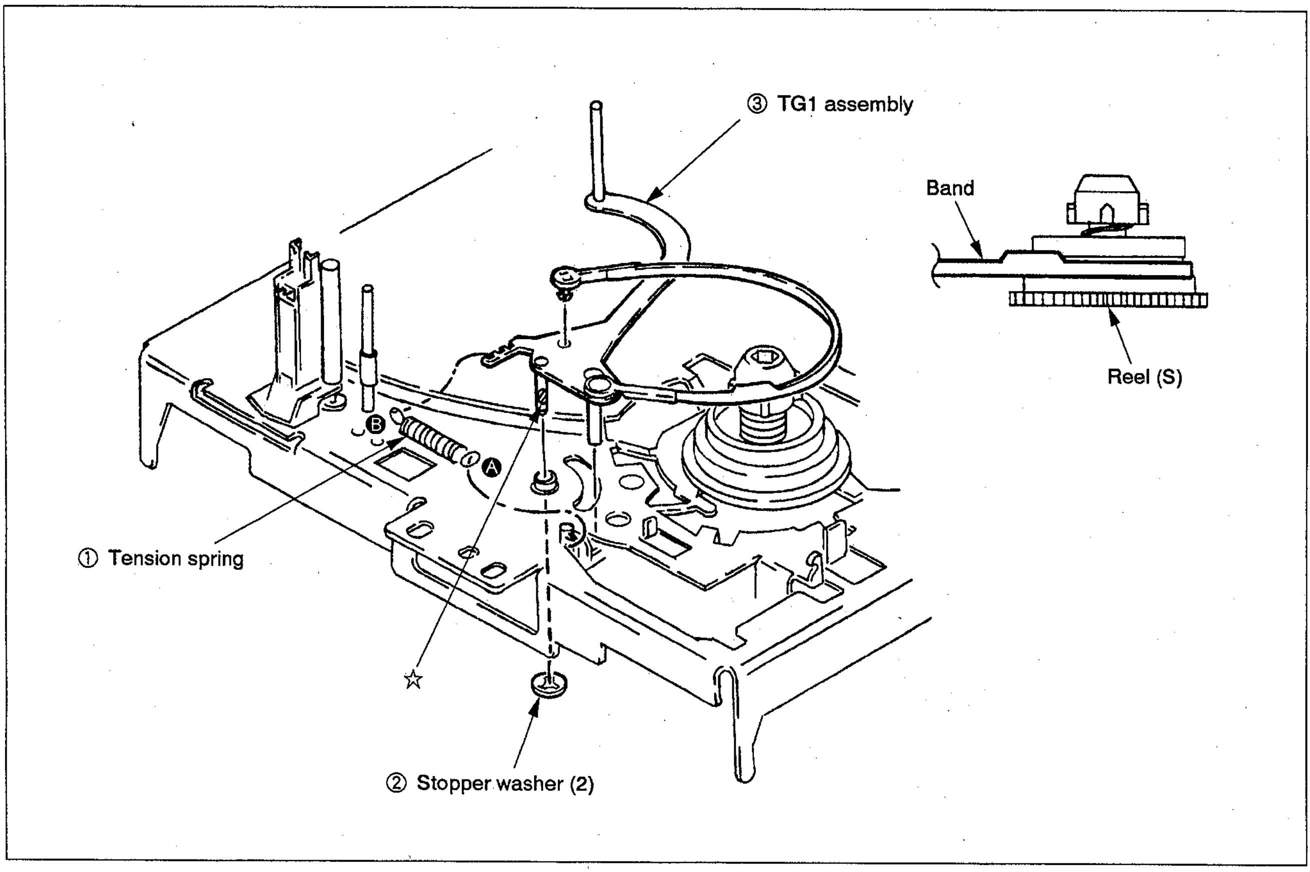

③ TG1 assembly
Band
Reel (S)
Ⓑ
Ⓐ
① Tension spring
☆
② Stopper washer (2)

Fig. 3-24

3-23. S WINDING BLOCK ASSEMBLY (Fig. 3-25)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-18.)
5) Remove stopper washer (2) ① to pull out S winding block assembly ②.
6) Remove torsion spring ③.

[Note on Mounting]

- At the last, hang torsion spring ② to the position Ⓐ.
- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions.

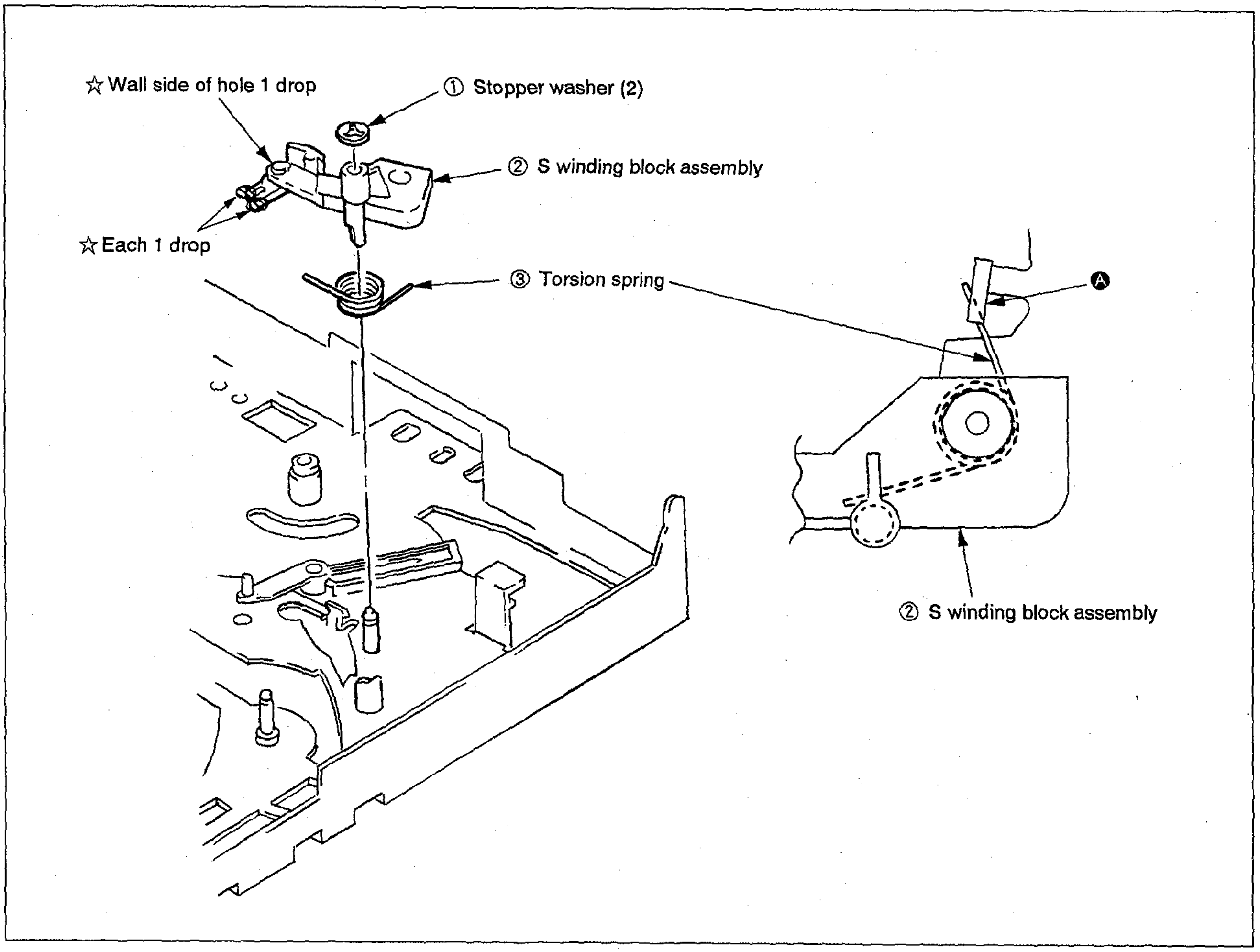

☆Wall side of hole 1 drop
① Stopper washer (2)
② S winding block assembly
☆Each 1 drop
③ Torsion spring
Ⓐ
② S winding block assembly

Fig. 3-25

3-24. TRIGGER LEVER AND RKB BLOCK ASSEMBLIES (Fig. 3-26)

1) Remove timing belt. (Refer to 3-3.)
2) Remove CAP brake assembly. (Refer to 3-4.)
3) Remove cam motor chassis block assembly. (Refer to 3-16.)
4) Remove main slider. (Refer to 3-18.)
5) Remove tension spring ① in the order Ⓐ to Ⓑ to remove trigger lever assembly ②.
6) Remove screws (3 × 8) ③ to remove RKB block assembly ④.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portions on trigger lever assembly. (Fig. A)

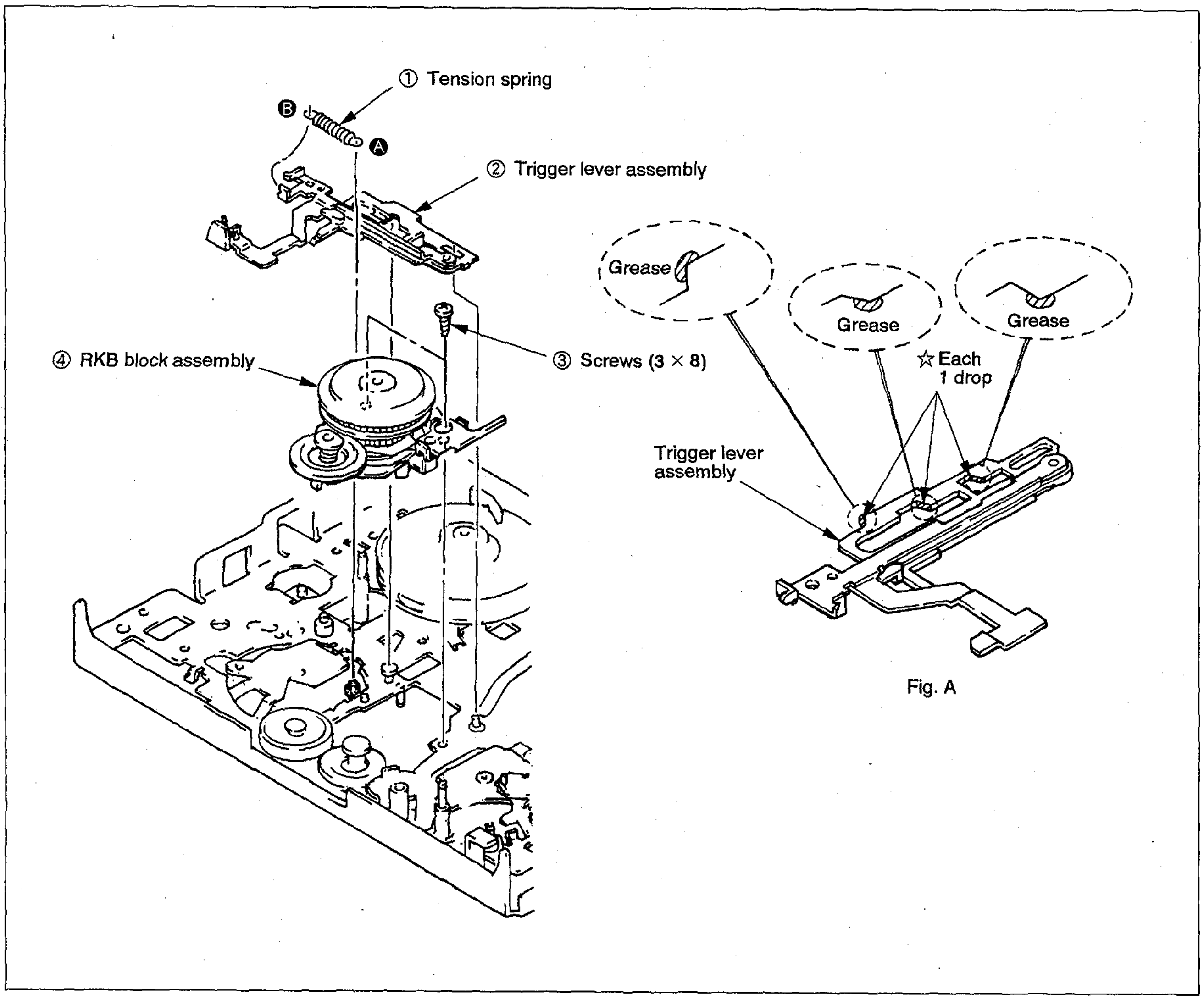

① Tension spring
Ⓑ
Ⓐ
② Trigger lever assembly
④ RKB block assembly
③ Screws (3 × 8)
Grease
Grease
Grease
☆Each 1 drop
Trigger lever assembly
Fig. A

Fig. 3-26

4. ADJUSTMENT

4-1. TAPE PATH ADJUSTMENT

The "Tape path" refers to the route of the tape from the supply reel disk to the take-up reel disc via the video heads.

Each component part of the tape transport system particularly the surface of parts which make direct contact with the tape must always be kept clean, free of dust, oil, scratches and so forth.

The tape path system is factory preadjusted, when parts of the tape transport system are replaced, be sure to make the required adjustments as precisely as possible in order to ensure stable tape transport.

4-1-1. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Fig. 4-1)

Purpose: stabilizes contact of the video head and the tape to maintain the tension of the tape so that it feeds at a constant level.

• Position adjustment

Mode	Treading is completed without a cassette loaded
Adjustment locations	Eccentric pin of TG1 band assembly

[Adjustment Method]

1) Allow the unit to go through the threading procedure without a cassette loaded.
2) Set the unit to play back, then turn the eccentric pin so that the tip of tension arm goes to the left side line carved on the mechanical chassis. (Fig. A)
3) After adjustment, go through the loading procedure once more without a cassette loaded, then check the position of the tension arm.

• Tension adjustment

Mode	Playback
Measuring instrument/tool	Torque cassete
Adjustment locations	Position for hooking the tension spring
Specified value	36 to 44 g•cm

[Adjustment Method]

1) Playback the torque cassette.
2) Check that the center value deviation reading on the torque cassette meets with the standards.
3) When the reading is higher than the standards: Move the spring toward direction Ⓐ.
   When the reading is less than the standards: Move the spring toward direction Ⓑ.

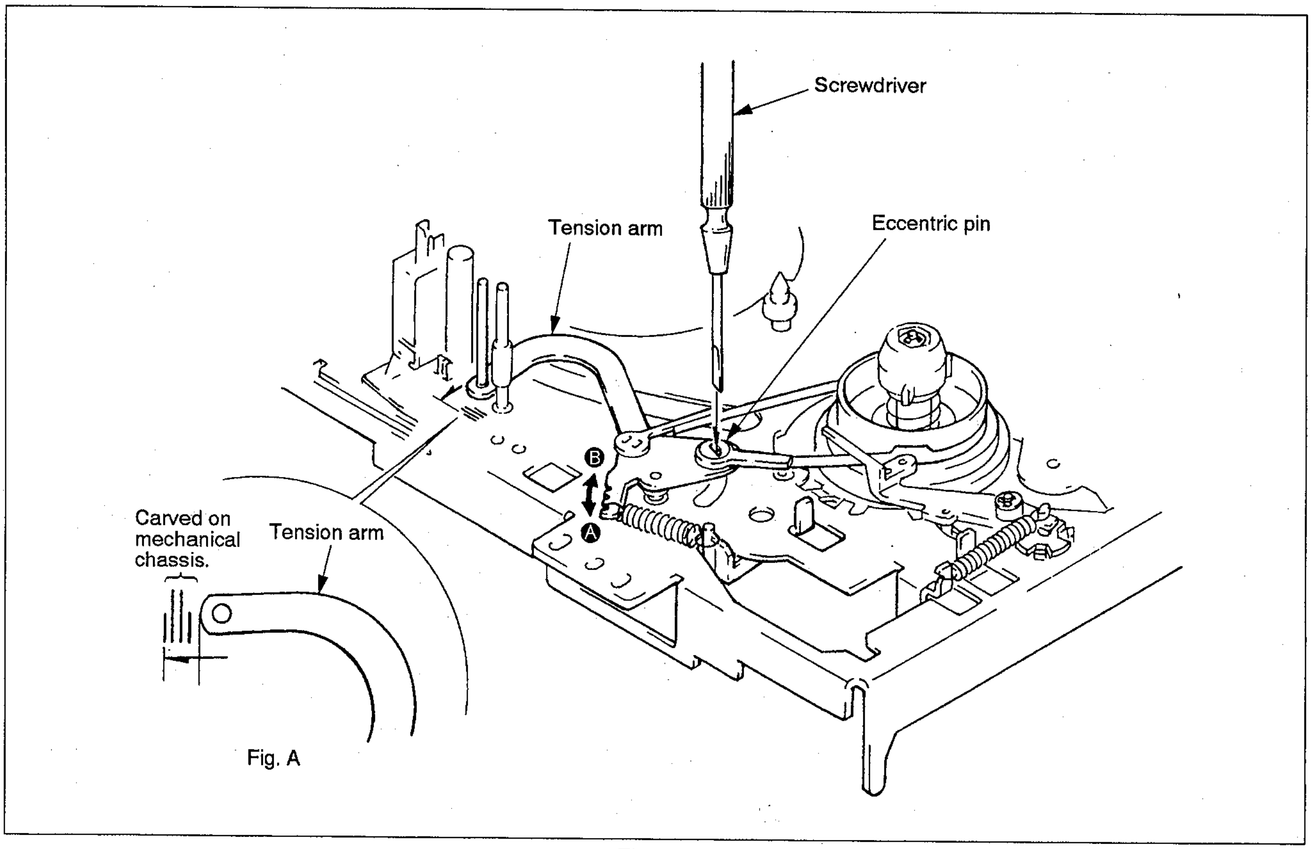


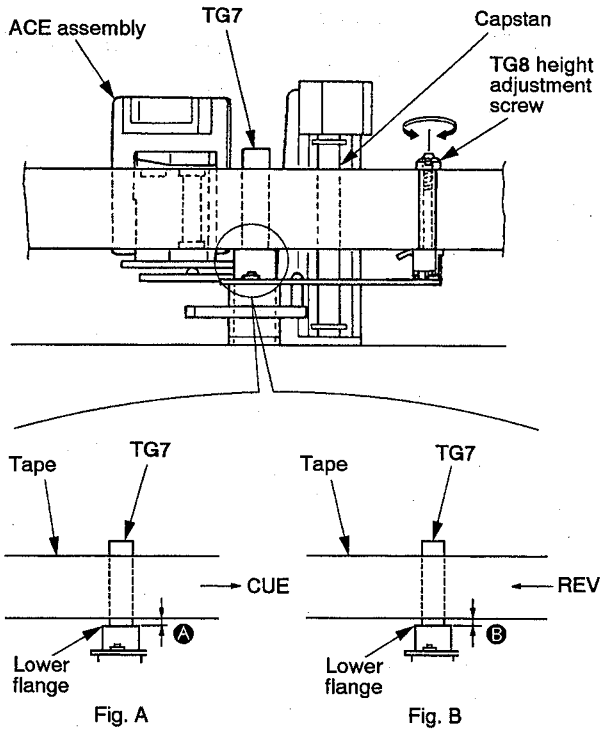
Fig. 4-1

4-1-2. TG8 GUIDE ROLLER HEIGHT ADJUSTMENT (Fig. 4-2)

Mode	Playback
Jig	Blank tape
Adjustment locations	Guide roller height adjustment screw
Specified value	0 to 0.1 mm

Procedure:

1) Set the tape, during CUE playing back, check the height from lower flange of TG7 to the running tape. (Fig. A)
2) During REV playing back, check the height from lower flange of TG7 to the running tape. (Fig. B)
3) When the difference between items 1) and 2) doesn't go to specified value, adjust by turning TG8 guide roller height adjustment screw.
4) Check the tape is creased or not between the capstan and TG8, adjust with TG8 guide roller height adjustment screw so that the tape is not creased during normal playback, CUE and REV.


ACE assembly
TG7
Capstan
TG8 height adjustment screw
Tape
TG7
CUE
Ⓐ
Lower flange
Tape
TG7
REV
Ⓑ
Lower flange
Fig. A
Fig. B

Difference between Ⓐ and Ⓑ = 0 to 0.1 mm

Fig. 4-2

4-1-3. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6 (Fig. 4-3)

Mode	Playback
Signal	Alignment tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	Guide roller height adjuster screw

[Adjustment Method]

1) Tracking (playback): Turn off the auto tracking, then press the tracking buttons ▽ and △ simultaneously to set the tracking at the center position.
(If adjustment is made after the drum is replaced, the tracking must be set at the max. RF output position.)
2) Height adjuster screw: Even out the RF output waveforms.
3) Press the tracking buttons (playback), ▽ and △ alternately.
4) Check that RF output drops the same amount at the front and rear edges.

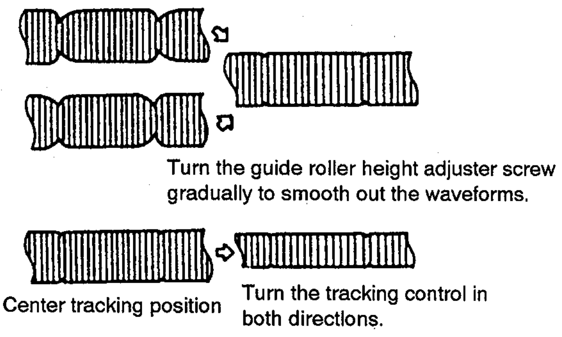

Turn the guide roller height adjuster screw gradually to smooth out the waveforms.
Center tracking position
Turn the tracking control in both directions.

Fig. 4-3

4-1-4. ACE HEAD ASSEMBLY ADJUSTMENT (ROUGH ADJUSTMENT) (Figs. 4-4 and 4-5)

Purpose: Allows the tape to make even contact with the head for recording and playback of the specified track.

Mode	Playback
Tool	Blank tape
Adjustment locations	Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Mount the ACE head assembly. At this time, adjust the height so that the height of guide flange No. 7 matches the level of the lower edge of the control head.
2) Remove the adjustment tool and load a new tape, then set the unit for playback.
3) Check that the tape does not curl or rise up noticeably near the ACE head.
4) If the tape curls up or rises noticeably, readjust the tilt adjuster screw, the azimuth adjuster screw and the height adjuster nut.
   (The height of the ACE head should be adjusted so that the lower edge of the tape is approx. 0.1 to 0.15 mm from the control head.)
5) Perform precision adjustment.

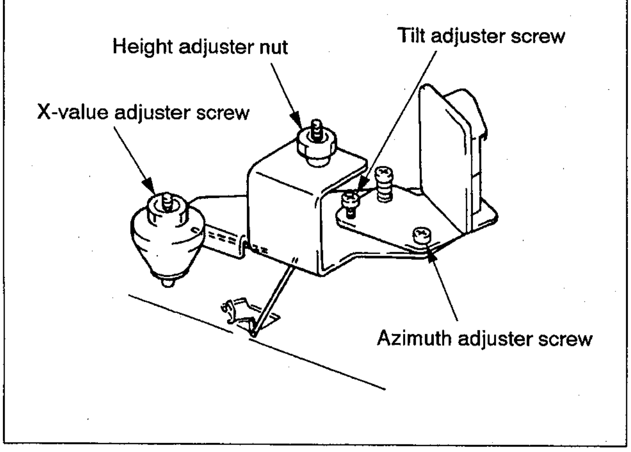

Height adjuster nut
Tilt adjuster screw
X-value adjuster screw
Azimuth adjuster screw

Fig. 4-4

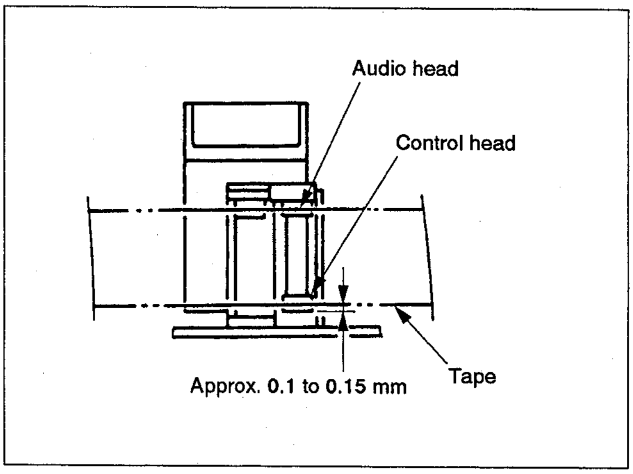

Audio head
Control head
Approx. 0.1 to 0.15 mm
Tape

Fig. 4-5

4-1-5. ACE HEAD ASSEMBLY ADJUSTMENT (PRECISION ADJUSTMENT)

Mode	Playback
Signal	Alignment tape (1kHz track)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Adjust the tilt adjuster screw in the FWD or REV mode so that the lower flange of guide No. 7 does not curl up or rise.
2) Alternately adjust the azimuth adjuster screw, the height adjuster nut, and the tilt adjuster screw to maintain even audio output at maximum with minimum deviation.

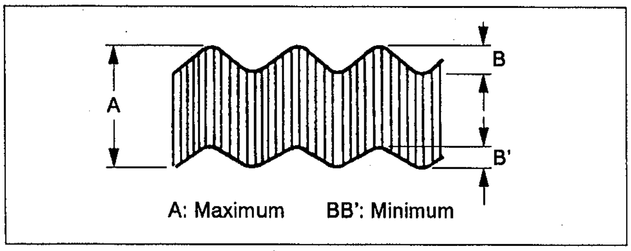

A
B
B'
A: Maximum
BB': Minimum

Fig. 4-6

4-1-6. X-VALUE ADJUSTMENT

Purpose: To obtain compatibility with other VTR

Precaution: Be sure to perform the preset tracking adjustment before perform this adjustment. (Refer to the Service Guide.)
Turn off the auto tracking and set the VTR for manual tracking mode.

Mode	Playback
Signal	Alignment tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	X-value adjuster screw

[Adjustment Method]

- **Adjustment by Hi-Fi alignment tape (NTSC only)**

  When the tracking is set at the center position (by pressing the ▽ and △ keys simultaneously), adjust the RF output to maximum.

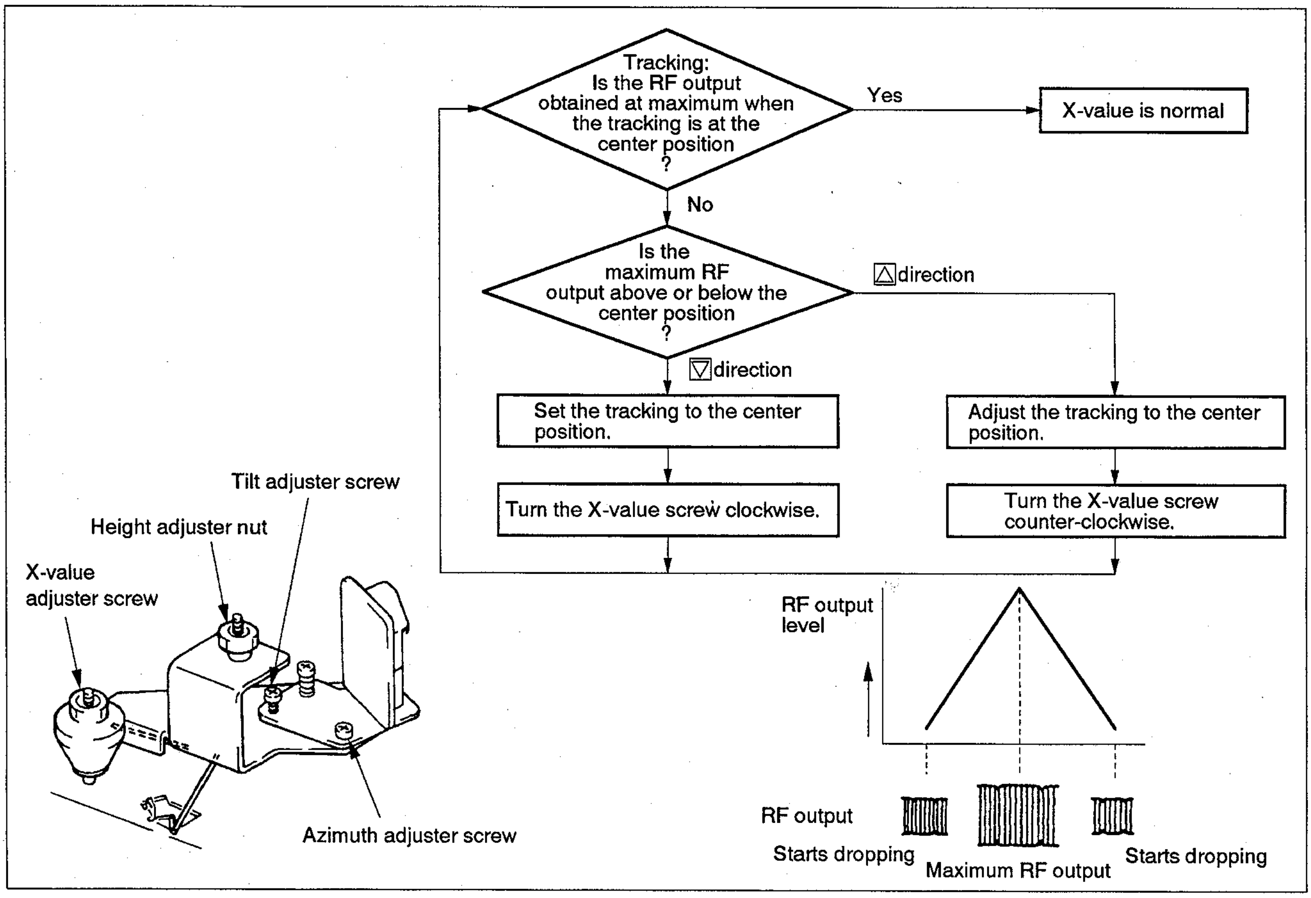

Tracking: Is the RF output obtained at maximum when the tracking is at the center position ?
Yes
X-value is normal
No
Is the maximum RF output above or below the center position ?
△direction
▽direction
Set the tracking to the center position.
Turn the X-value screw clockwise.
Adjust the tracking to the center position.
Turn the X-value screw counter-clockwise.
Tilt adjuster screw
Height adjuster nut
X-value adjuster screw
Azimuth adjuster screw
RF output level
RF output
Starts dropping
Maximum RF output
Starts dropping

Fig. 4-7

- **Adjustment by alignment tape**

  Adjust the X-value adjuster screw so that maximum RF output is obtained and also that the RF output drops to the same position on pressing the respective ▽ and △ buttons while the tracking is set at the center position.

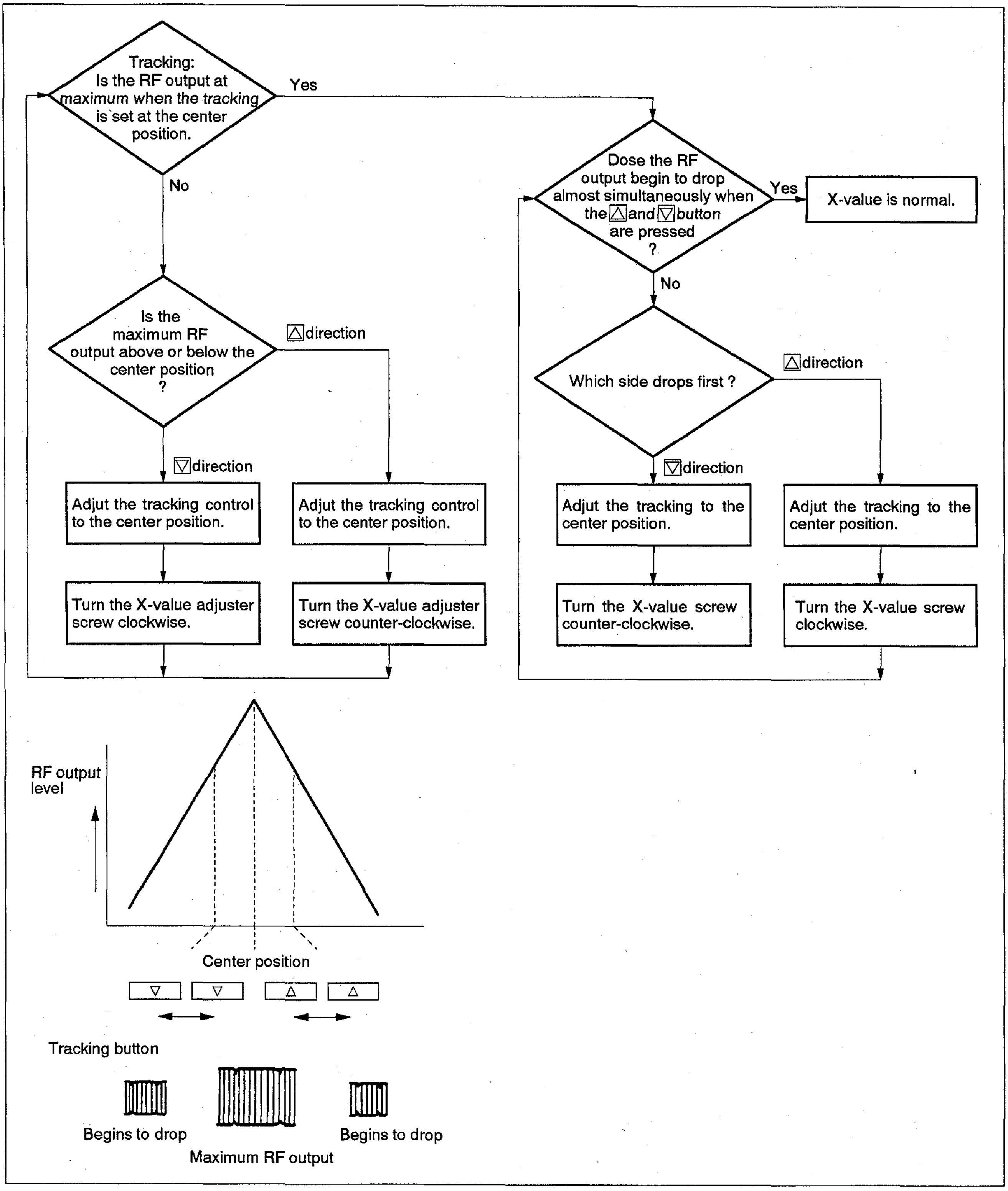

Tracking:
Is the RF output at maximum when the tracking is set at the center position.
Yes
No
Is the maximum RF output above or below the center position ?
△direction
▽direction
Adjut the tracking control to the center position.
Adjut the tracking control to the center position.
Turn the X-value adjuster screw clockwise.
Turn the X-value adjuster screw counter-clockwise.
Dose the RF output begin to drop almost simultaneously when the △and▽button are pressed ?
Yes
X-value is normal.
No
Which side drops first ?
△direction
▽direction
Adjut the tracking to the center position.
Adjut the tracking to the center position.
Turn the X-value screw counter-clockwise.
Turn the X-value screw clockwise.
RF output level
Center position
▽
▽
△
△
Tracking button
Begins to drop
Maximum RF output
Begins to drop

Fig. 4-8

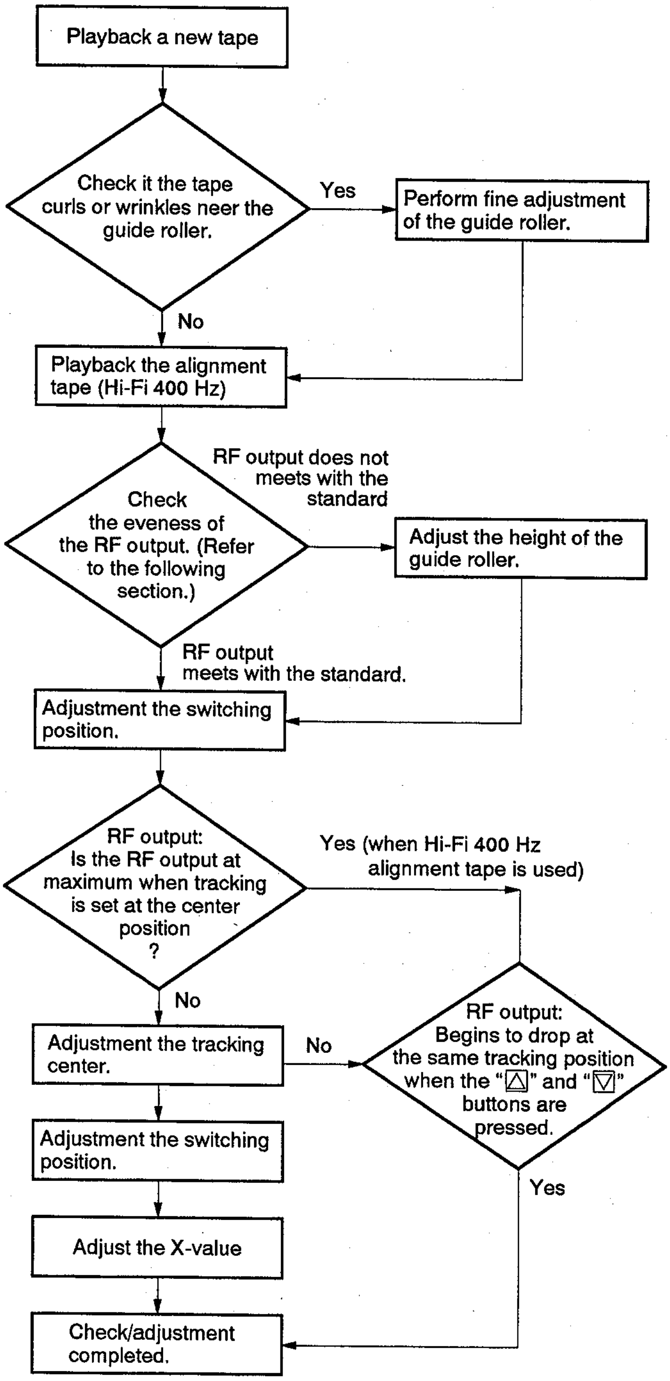
4-1-7. ADJUSTMENTS AFTER REPLACING THE DRUM (VIDEO HEAD)

Purpose: Co-relative height, X-value and other factors of the drum will deviate from those of the guide roller. If the drum is replaced properly, these deviations are extremely small.

Precaution: Turn off the auto tracking and set the manual tracking mode.

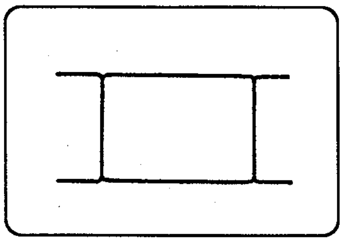
Mode	Playback
Signal	Alignment tape, blank tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SW P pin for RF PC board check.
Adjustment locations	Guide roller (refer to 4-1-2, 4-1-3.) Switching position, Tracking preset, SP delay mono-multi (Refer to the Service Manual), X-value. (refer to 4-1-6.)

[Adjustment Method]

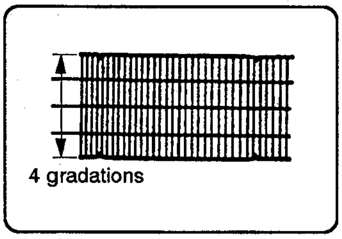

Playback a new tape
Check it the tape curls or wrinkles neer the guide roller.
Yes
Perform fine adjustment of the guide roller.
No
Playback the alignment tape (Hi-Fi 400 Hz)
RF output does not meets with the standard
Check the eveness of the RF output. (Refer to the following section.)
Adjust the height of the guide roller.
RF output meets with the standard.
Adjustment the switching position.
RF output: Is the RF output at maximum when tracking is set at the center position ?
Yes (when Hi-Fi 400 Hz alignment tape is used)
No
Adjustment the tracking center.
No
RF output: Begins to drop at the same tracking position when the "△" and "▽" buttons are pressed.
Yes
Adjustment the switching position.
Adjust the X-value
Check/adjustment completed.

[Checking the evenness and fluctuation of the RF output]

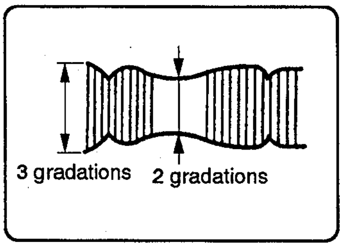
1) Set the RF output to the maximum level using the tracking buttons.



2) Perform fine adjustment of the voltage level range of the oscilloscope, then adjust the RF output deviation to within 4 gradations.



3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 3 gradations.
4) At this time, check if the minimum amplitude is more than 2 gradations.



5) Check that the RF output fluctuation between minimum and maximum levels is within 13%.

4-1-8. CHECKING THE TENSION AND TORQUE

Purpose: To check that the tension, torque and compression force of the tape take-up section and mobile sections to ensure smooth tape run and achieve standard VTR performance.
If the tape transport is not smooth or problems occur in relation to the tape transport speed, perform the following check.

Mode	Each operation mode without loading a cassette tape. (Refer to section 1-3.)
Measuring instrument	Torque gauge, Torque gauge adaptor

Item	VTR operation mode	Reel to be measured	Measurement value
Main brake torque	Stop	Supply and take-up reels	170 g•cm or more
Review torque	Review	Supply reel	180 ± 30 g•cm (using the torque cassette)
Take-up torque	Playback	Take-up reel	95 ± 25 g•cm (using the torque cassette)
Back tension torque	Playback	Take-up reel	33 to 44 g•cm (using the torque cassette)

[Check Method]

Measure the torque using the torque gauge and torque gauge adaptor with the torque gauge fixed.

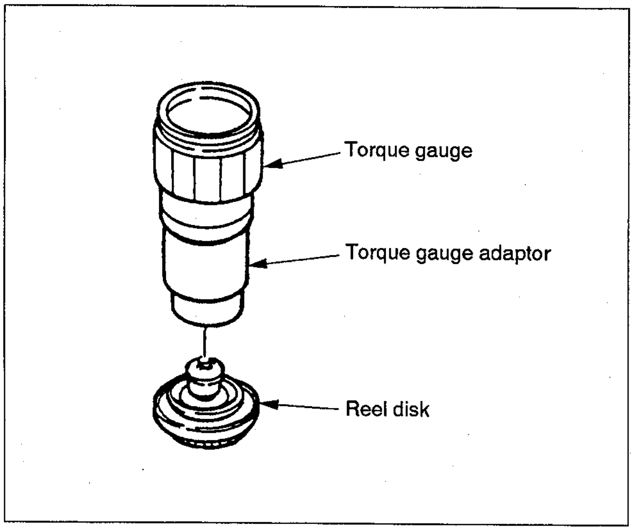


Fig. 4-9

VHS MECHANICAL ADJUSTMENT MANUAL IV

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

9-973-623-11

Published by Personal A&V Products Div.
Quality Engineering Dept.

VHS MECHANICAL ADJUSTMENT MANUAL IV

SONY®
SERVICE MANUAL

H MECHANISM

SUPPLEMENT-1

1. **How to Use the Mode Selector II for Adjusting H Type Mechanism Assembly.**
2. **Adjusting Mechanism Using New Alignment Tape (KRV-52NE For NTSC).**

File this supplement with the VHS mechanical adjustment IV.

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MICROFILM

1. HOW TO USE THE MODE SELECTOR Ⅱ FOR ADJUSTING H TYPE MECHANISM ASSEMBLY

1-1. OUTLINE

To activate the VHS system H type mechanism assembly using mode selector Ⅱ (J-6082-282-A), use connector conversion jig (J-6090-052-A). By using the connector conversion jig, the following operations are possible.

- Loading and unloading action by the loading motor
- Reading of the current setting of the mode switch
- Normal and reverse rotation of the capstan motor

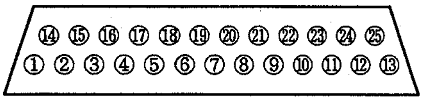
1-2. PREPARATION

1-2-1. ADDITION OF POWER SUPPLY CABLE (Already added Mode Selector Ⅱ also available)

In order to drive the capstan motor, the power +5 V and +12 V are supplied from the Mode Selector Ⅱ. Disassemble the D-SUB connector of the Mode Selector cable, then solder the following three places.

Supplied 3-pin cable	DSUB connector of the mode selector Ⅱ	Voltage
Pin 1 (Red index)	Pin 20	+12 V
Pin 2	Pin 25	GND
Pin 3	Pin 24	+5 V

- Connector pin number assignment of the DSUB connector (From the soldering side)



- When connections are made, check that +5 V and +12 V are available at the 3-pin cable connector.

1-2-2. CHECKING THE SOFTWARE VERSION

Turn on the power of the mode selector II.
If the reading for the software version on the mode selector II is not 1.10 or higher, replace the New ROM (J-6082-314-A).

1-3. CONNECTION

1-3-1. CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE MODE SELECTOR Ⅱ (See Fig. 1-1)

Insert the connectors of the two 6-pin cables (one is white and the other is black) and the 3-pin cable from the mode selector Ⅱ to the corresponding connectors on the connector conversion jig (J-6090-052-A).

1-3-2. CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE H TYPE MECHANISM ASSEMBLY

With the power of the mode selector Ⅱ turned off, insert the following three connectors to the corresponding connectors on the H type mechanism assembly.

- 3-pin connector for the loading motor
- 5-pin connector for the mode switch
- 8-pin connector for the capstan motor

Set the speed control for the minimum setting (fully counterclockwise).

1-4. OPERATION

1-4-1. OPERATION OF THE LOADING MOTOR ON THE H TYPE MECHANISM ASSEMBLY

(1) Select the H type mechanism assembly setting on the mode selector Ⅱ .

(2) After this, procedures are the same as those for the previous model types.
For the operating method, see pages 3 to 5 of "8 mm Video Mechanism Manual Ⅵ (TK Mechanism) Supplement-1".
For the loading method, see page 3 of "VHS Mechanical Adjustment Manual Ⅳ (H Mechanism)".

1-4-2. OPERATION OF THE CAPSTAN MOTOR ON THE H TYPE MECHANISM ASSEMBLY

(1) For the loading motor operation under Section 1-4-1, change the mode setting to the FF/REW mode with the mode switch.

(2) Turn the speed control gradually in clockwise direction, and the capstan motor starts rotating. To turn the capstan motor in desired rotating direction, change the FWD/RVS setting of the rotating direction switch.

1-5. PRECAUTIONS

- Turn the speed control only when necessary. Otherwise, hold the speed control turned at fully counterclockwise direction. If the power of the mode selector II is turned on with the speed control turned in clockwise direction, +12V power fails and the power of the mode selector II cannot be turned on.
- Although the connector conversion jig (J-6090-052-A) has rubber feet, do not make a short circuit on the bottom surface of the connector conversion jig via foreign conductive materials.

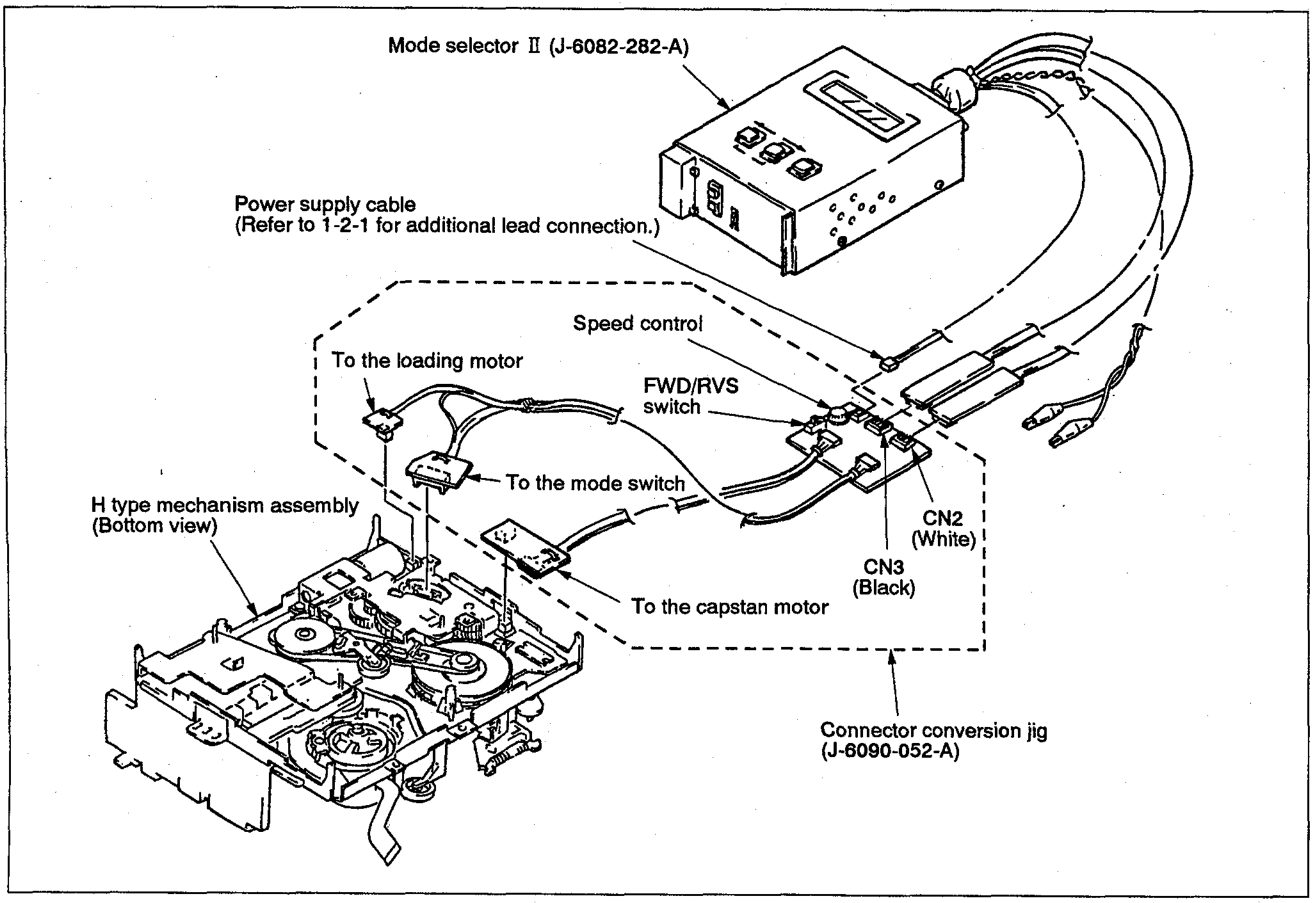

Mode selector Ⅱ (J-6082-282-A)
Power supply cable
(Refer to 1-2-1 for additional lead connection.)
Speed control
To the loading motor
FWD/RVS switch
To the mode switch
H type mechanism assembly
(Bottom view)
CN2
(White)
CN3
(Black)
To the capstan motor
Connector conversion jig
(J-6090-052-A)

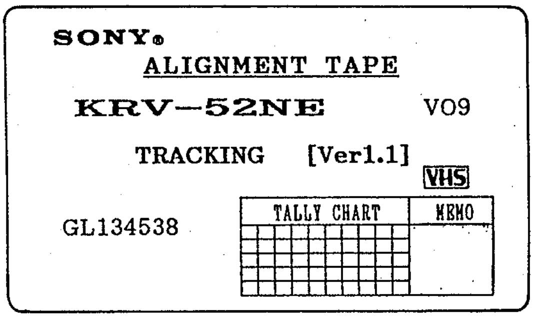
Fig. 1-1

2. ADJUSTING THE MECHANISM USING NEW ALIGNMENT TAPE (KRV-52NE for NTSC)

The conventional alignment tape (For NTSC) is now replaced with alignment tape KRV-52NE, and the following describes how to align the mechanism using the KRV-52NE. For details on the use of KRV-51N2 for each model, refer to the service manuals which will be issued in the future.

Name	Parts No.	Remarks
Alignment tape KRV-52NE for NTSC	8-192-605-41	For tape path, audio azimuth, and X-value adjustments
Alignment tape KRV-51N2 for NTSC	8-192-605-32	For electrical adjustments (RF, AF, and switching position) and operation check

Note: The KRV-52NE has or does not have Ver No. depending on new or old type as shown below. (New one has Ver No.)
Note that an adjusting method of X-value is different.



SONY®
ALIGNMENT TAPE
KRV–52NE V09
TRACKING [Ver1.1]
VHS
GL134538
TALLY CHART MEMO

Contents:
KRV-52NE (NTSC)

Time	Video	Audio
20 min.	Recording only at 1 MHz, A-ch. EP mode RF skipping once per 5 frames	5 kHz full tracks

KRV-51N2 (NTSC)

Class	Mode	Time	Video	Audio (HIFI/Normal)
1	SP	7 min.	Color bar	400 Hz
2	SP	3 min.	Mono. scope	400 Hz
3	EP	7 min.	Color bar	400 Hz
4	EP	3 min.	Mono. scope	400 Hz

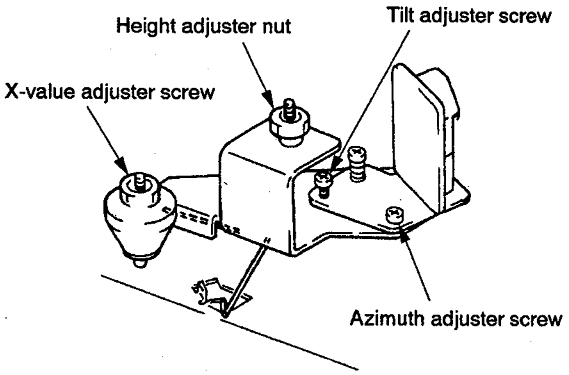
2-1. ADJUSTMENT USING ALIGNMENT TAPE (KRV-52NE for NTSC having no version No.)

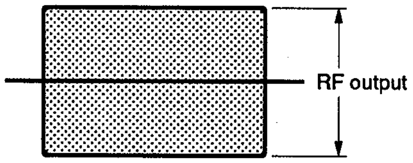
2-1-1. X-VALUE ADJUSTMENT (Using the tape having no version No.)

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC having no version No.)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	X-value adjuster screw

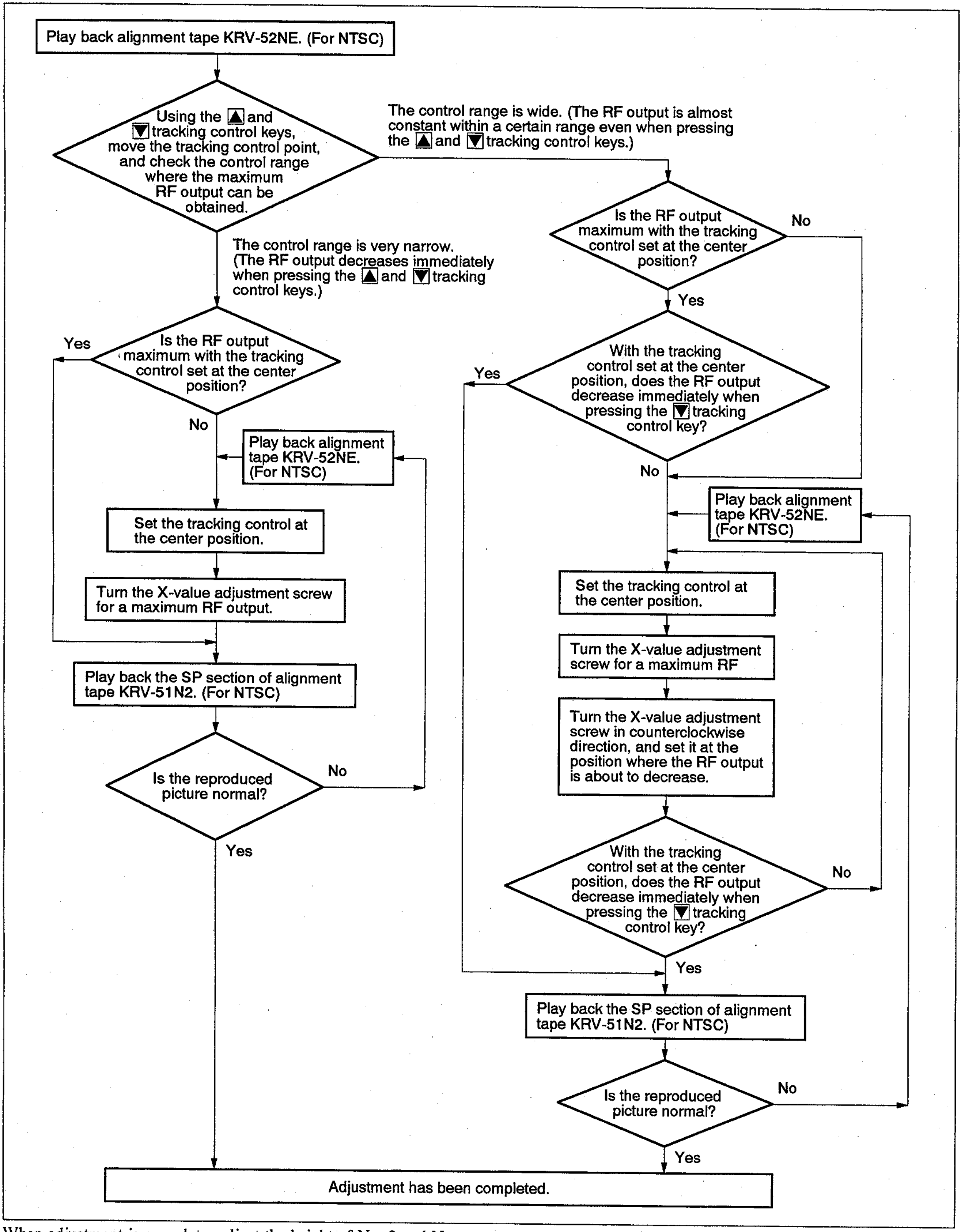




RF output shall be maximum at the center position of the tracking control.

[Adjustment Method]
Set the tracking control at the center position. For the VCRs equipped with narrow gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

X-VALUE ADJUSTMENT (Using the tape having no version No.)



Play back alignment tape KRV-52NE. (For NTSC)
Using the ▲ and ▼ tracking control keys, move the tracking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF output.
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
No
Yes
Is the RF output maximum with the tracking control set at the center position?
No
Yes
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Turn the X-value adjustment screw in counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
No
Yes
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
No
Yes
Adjustment has been completed.

When adjustment is complete, adjust the height of No. 3 and No. 6 guide rollers on page 10.

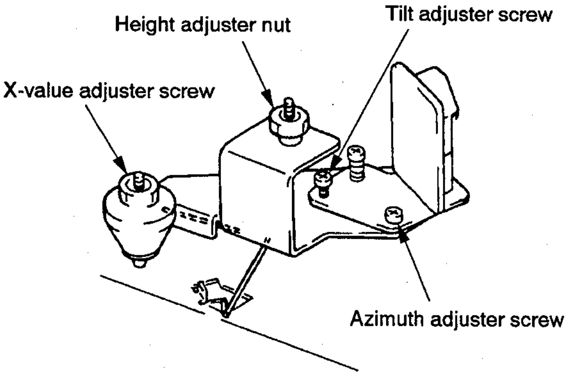
2-2. ADJUSTMENT USING ALIGNMENT TAPE (KRV-52NE for NTSC having the version No.)

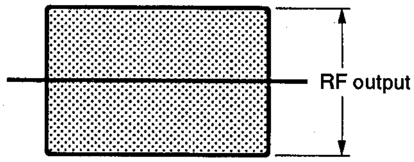
2-2-1. X-VALUE ADJUSTMENT (Using the tape having the version No.)

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC having the version No.)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	X-value adjuster screw



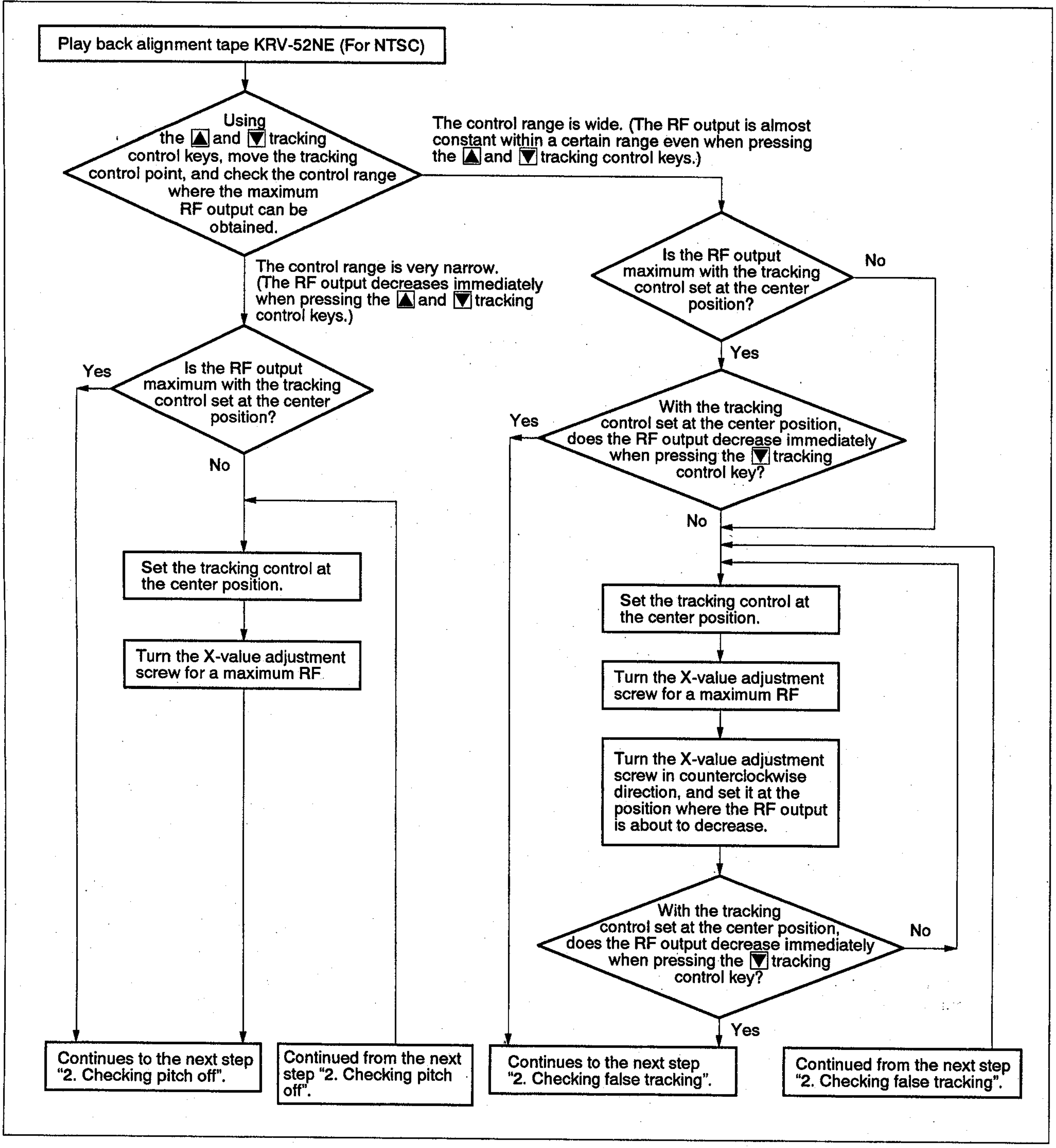


RF output shall be maximum at the center position of the tracking control.

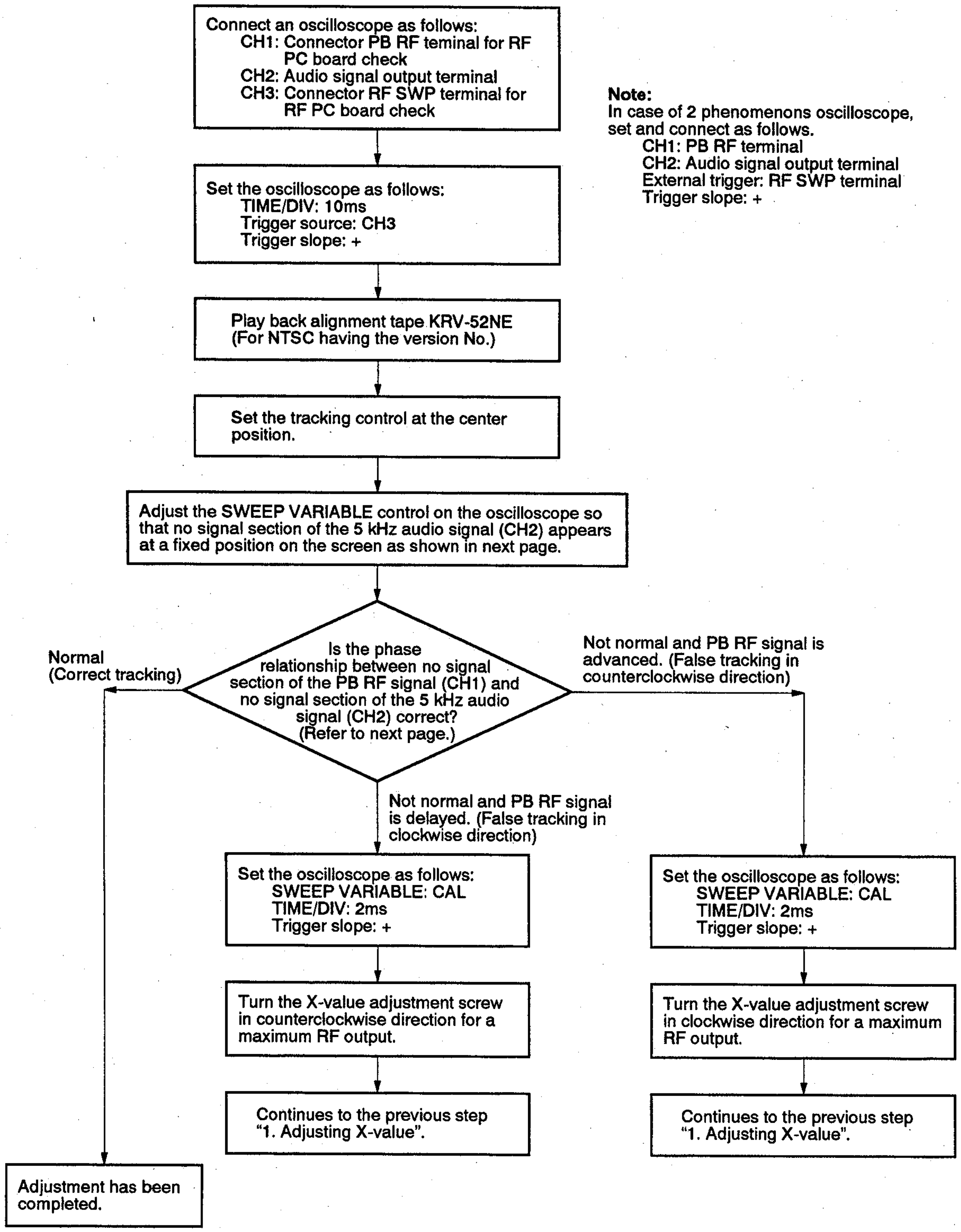
[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with narrow gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

1. Adjusting X-value (Using the tape having the version No.)


Play back alignment tape KRV-52NE (For NTSC)
Using the ▲ and ▼ tracking control keys, move the tracking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Continues to the next step "2. Checking pitch off".
Continued from the next step "2. Checking pitch off".
Is the RF output maximum with the tracking control set at the center position?
No
Yes
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Turn the X-value adjustment screw in counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
No
Yes
Continues to the next step "2. Checking false tracking".
Continued from the next step "2. Checking false tracking".

2. Checking false tracking (Using the tape having the version No.)



Connect an oscilloscope as follows:
CH1: Connector PB RF teminal for RF PC board check
CH2: Audio signal output terminal
CH3: Connector RF SWP terminal for RF PC board check

Note:
In case of 2 phenomenons oscilloscope, set and connect as follows.
CH1: PB RF terminal
CH2: Audio signal output terminal
External trigger: RF SWP terminal
Trigger slope: +

Set the oscilloscope as follows:
TIME/DIV: 10ms
Trigger source: CH3
Trigger slope: +

Play back alignment tape KRV-52NE (For NTSC having the version No.)

Set the tracking control at the center position.

Adjust the SWEEP VARIABLE control on the oscilloscope so that no signal section of the 5 kHz audio signal (CH2) appears at a fixed position on the screen as shown in next page.

Is the phase relationship between no signal section of the PB RF signal (CH1) and no signal section of the 5 kHz audio signal (CH2) correct? (Refer to next page.)

Normal (Correct tracking)

Adjustment has been completed.

Not normal and PB RF signal is delayed. (False tracking in clockwise direction)

Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +

Turn the X-value adjustment screw in counterclockwise direction for a maximum RF output.

Continues to the previous step "1. Adjusting X-value".

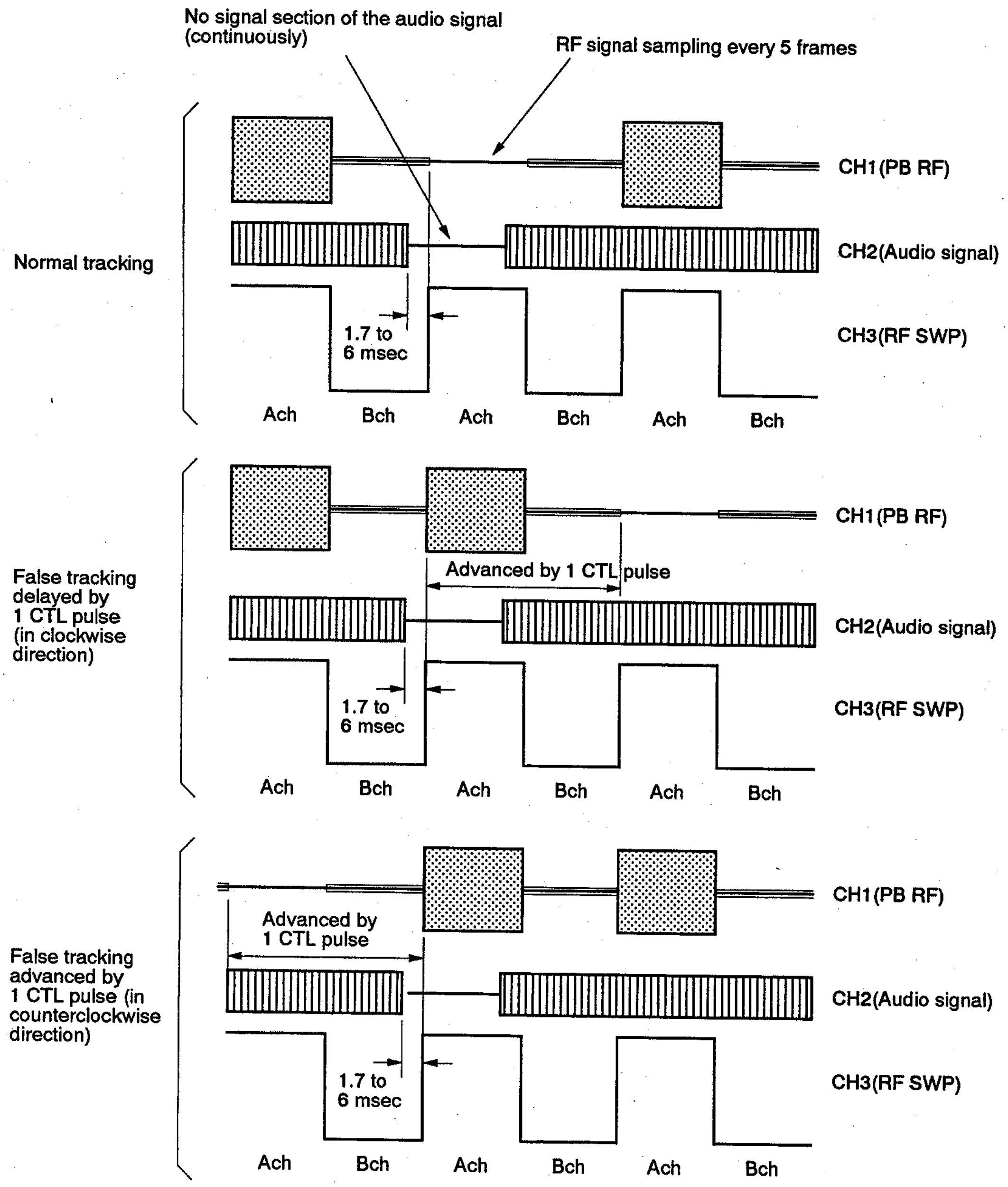
Not normal and PB RF signal is advanced. (False tracking in counterclockwise direction)

Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +

Turn the X-value adjustment screw in clockwise direction for a maximum RF output.

Continues to the previous step "1. Adjusting X-value".

Using the tape having the version No.


No signal section of the audio signal (continuously)
RF signal sampling every 5 frames
Normal tracking
CH1(PB RF)
CH2(Audio signal)
CH3(RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch
False tracking delayed by 1 CTL pulse (in clockwise direction)
Advanced by 1 CTL pulse
CH1(PB RF)
CH2(Audio signal)
CH3(RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch
False tracking advanced by 1 CTL pulse (in counterclockwise direction)
Advanced by 1 CTL pulse
CH1(PB RF)
CH2(Audio signal)
CH3(RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch

2-3. ADJUSTING THE MECHANISM USING ALIGNMENT TAPE (KRV-52NE for NTSC)

2-3-1. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6

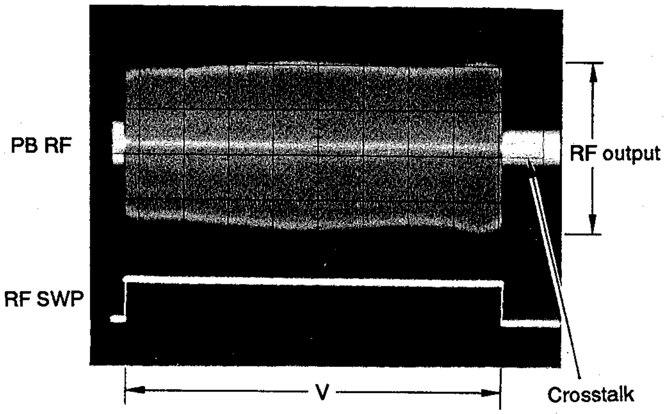
Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	Height adjustment screw for No.3 tape guide roller Height adjustment screw for No.6 tape guide roller

[Adjustment Method]

The following adjustment shall be carried out after completed Section 2-1-1 "X-value adjustment and check".

1) Deactivate the automatic tracking control, and set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

2) Check if the RF output changes in amplitude by pressing the tracking control key. The RF output should change periodically (changes from a minimum amplitude to a maximum amplitude, and to the minimum amplitude again).

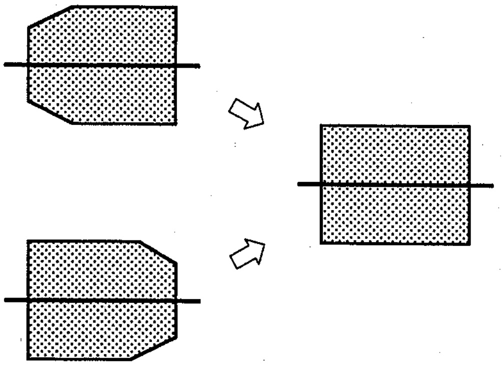


3) Turn the height adjustment screws of tape guide rollers No.3 and No.6 so that the RF output envelope becomes as flat as possible.

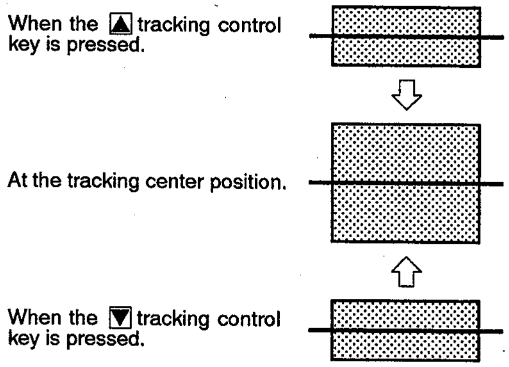
4) Press the ▲ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

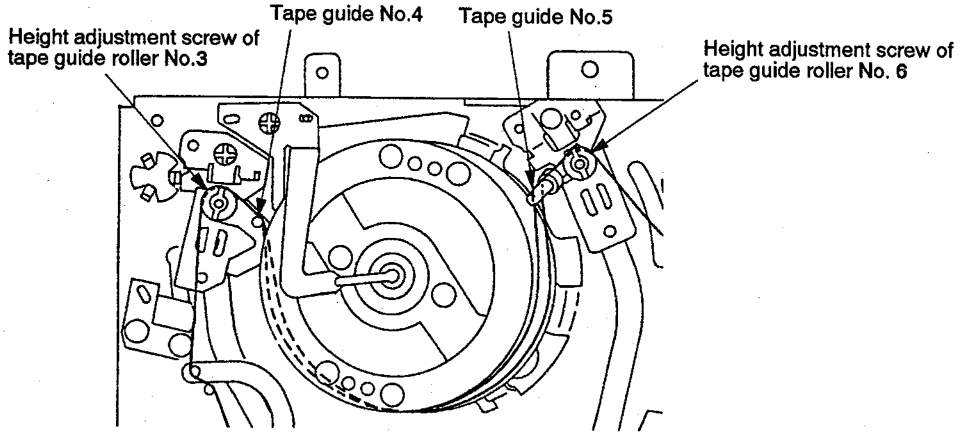
5) Press the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

Turn the height adjustment screws of tape guide rollers No.3 and No.6 little by little so that the RF output envelope becomes as flat as possible.



Press the ▼ tracking control key, then the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.


When the ▲ tracking control key is pressed.
At the tracking center position.
When the ▼ tracking control key is pressed.


Tape guide No.4
Tape guide No.5
Height adjustment screw of tape guide roller No.3
Height adjustment screw of tape guide roller No. 6

2-3-2. ACE HEAD ASSEMBLY ADJUSTMENT (ROUGH ADJUSTMENT) (Figs. 2-1 and 2-2)

Purpose: Allows the tape to make even contact with the head for recording and playback of the specified track.

Mode	Playback
Jig	Blank tape
Adjustment locations	Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Mount the ACE head assembly. At this time, adjust the height so that the height of guide flange No. 7 matches the level of the lower edge of the control head.
2) Remove the adjustment tool and load a new tape, then set the unit for playback.
3) Check that the tape does not curl or rise up noticeably near the ACE head.
4) If the tape curls up or rises noticeably, readjust the tilt adjuster screw and the height adjuster nut.
   (The height of the ACE head should be adjusted so that the lower edge of the tape is approx. 0.1 to 0.15 mm from the control head.)
5) Perform precision adjustment.

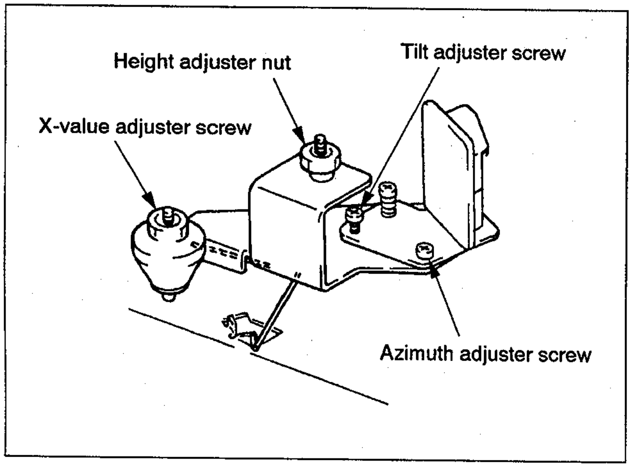


Fig. 2-1

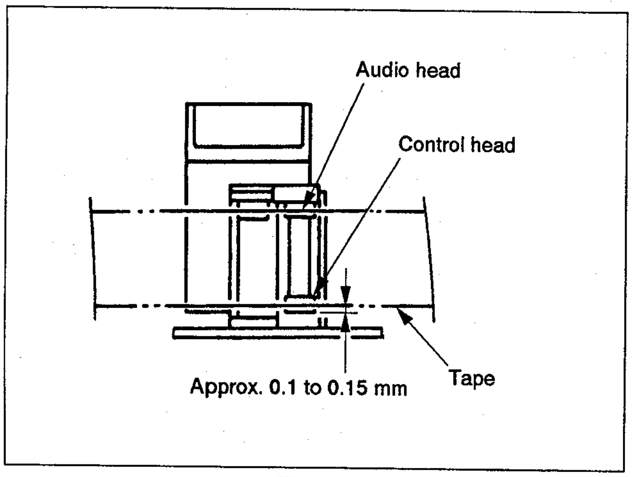


Fig. 2-2

2-3-3. ACE HEAD ASSEMBLY ADJUSTMENT (PRECISION ADJUSTMENT)

Mode	Playback
Signal	Alignment tape (KRV-52NE 5 kHz) (For NTSC)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Adjust the tilt adjuster screw in the FWD or REV mode so that the lower flange of guide No. 7 does not curl up or rise.
2) Alternately adjust the azimuth adjuster screw, the height adjuster nut, and the tilt adjuster screw to maintain even audio output at maximum with minimum deviation.

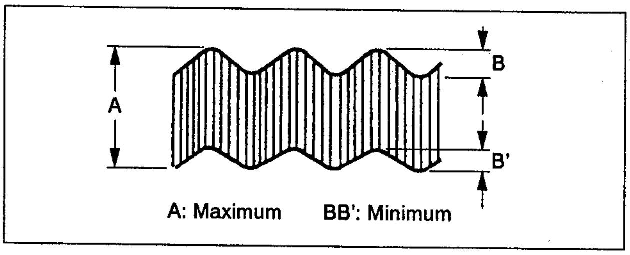


Fig. 2-3

2-3-4. ADJUSTMENTS AFTER REPLACING THE DRUM (VIDEO HEAD)

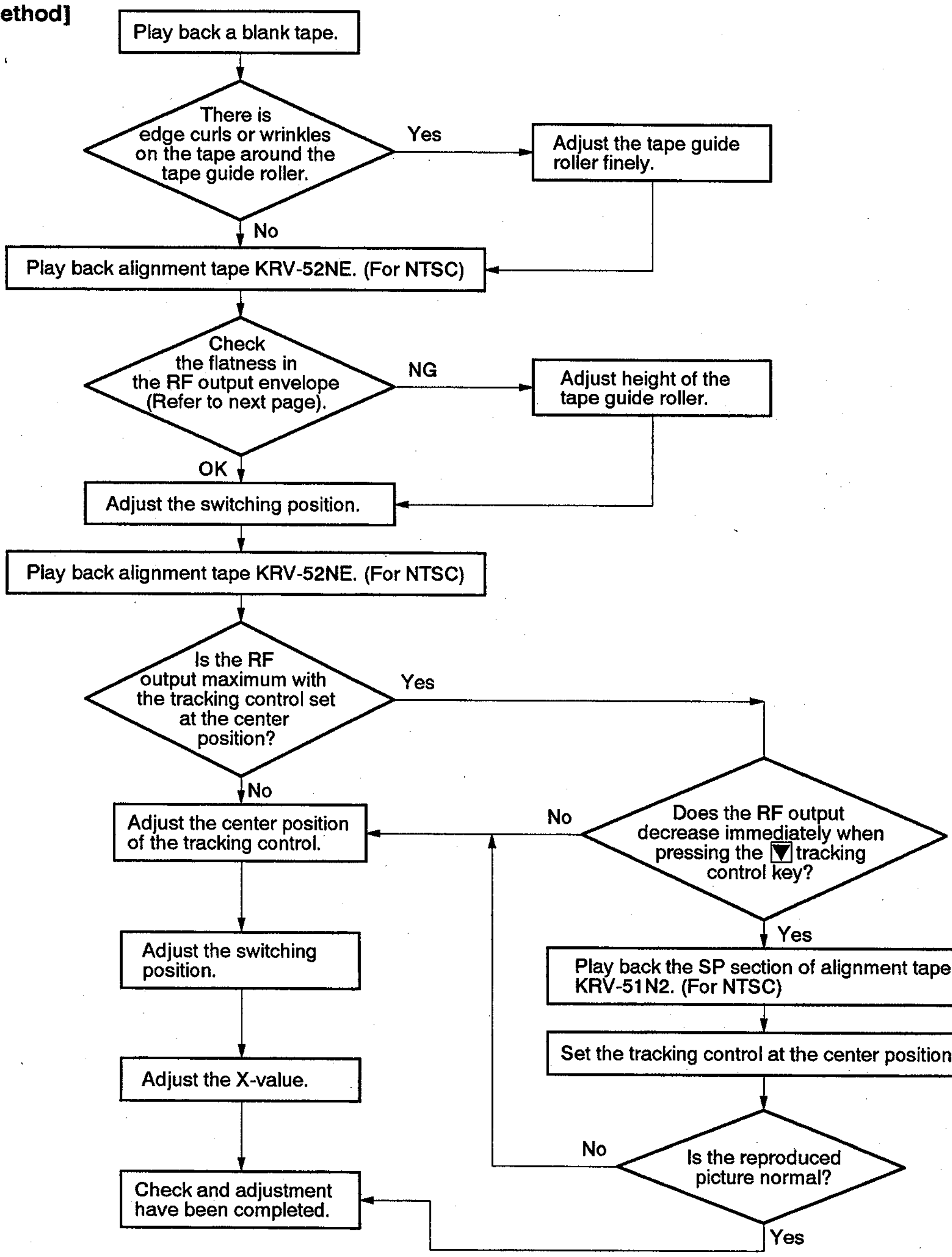
Purpose: Co-relative height, X-value and other factors of the drum will deviate from those of the guide roller. If the drum is replaced properly, these deviations are extremely small.

Note 1: Deactivate the automatic tracking control for setting the mechanism in manual tracking control mode.

Note 2: To set the tracking control at the center position, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

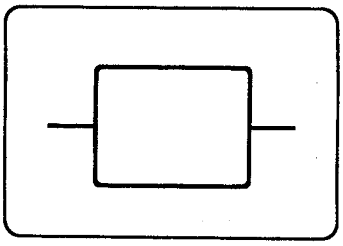
Mode	Playback
Signal	Alignment tape KRV-52NE (For NTSC), blank tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SWP pin for RF PC board check.
Adjustment locations	Guide roller (Refer to 2-3-1.) Switching position (Refer to the Service Manual) X-value (Refer to 2-1-1, 2-1-2.)

[Adjustment Method]

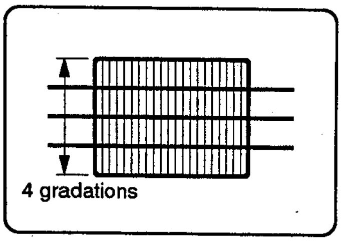

Play back a blank tape.
There is edge curls or wrinkles on the tape around the tape guide roller.
Yes
Adjust the tape guide roller finely.
No
Play back alignment tape KRV-52NE. (For NTSC)
Check the flatness in the RF output envelope (Refer to next page).
NG
Adjust height of the tape guide roller.
OK
Adjust the switching position.
Play back alignment tape KRV-52NE. (For NTSC)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Adjust the center position of the tracking control.
No
Does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Adjust the switching position.
Set the tracking control at the center position.
Adjust the X-value.
No
Is the reproduced picture normal?
Check and adjustment have been completed.
Yes

[Checking the evenness and fluctuation of the RF output]

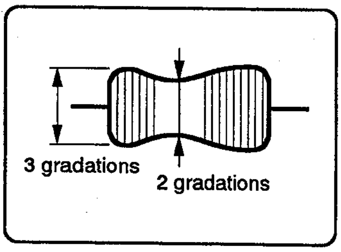
1) Set the RF output to the maximum level using the tracking buttons.



2) Perform fine adjustment of the voltage level range of the oscilloscope, then adjust the RF output deviation to within 4 gradations.



3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 3 gradations.
4) At this time, check if the minimum amplitude is more than 2 gradations.



5) Check that the RF output fluctuation between minimum and maximum levels is within 13%.

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Quality Engineering Dept.

VHS MECHANICAL ADJUSTMENT MANUAL IV

SONY®
SERVICE MANUAL

H MECHANISM

SUPPLEMENT-2

File this supplement with the VHS mechanical adjustment IV and supplement-1.

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2-3.	TG3, TG6 Guide Roller Assembly	3
2-4.	TG8 Assembly	4
2-5.	Tension Regulator (TG1) Position Tension Adjustment	5
2-6.	TG8 Guide Roller Height Adjustment	6

1. CORRECTION

In the VHS Mechanism Adjustment Manual IV (Supplement-1), an adjustment sequence was wrong, and it is corrected as follow;

1-1. Adjustment Sequence (VHS Mechanism Adjustment Manual IV (Supplement-1) Page 6 to 11)

(1) Adjustment of No. 3 and No. 6 guide roller height
Delete the "The following adjustment shall be carried out after completed Section 2-1-1 "X-value adjustment and check" under "Adjustment Method" on page 10.

(2) Adjustment of ACE head assembly

Note: In the adjustment of ACE head assembly (coarse adjustment and fine adjustment), if a azimuth, height and tilt were adjusted, again adjust the height of No. 3 and No. 6 guide rollers.

(3) Adjustment of X value

MICROFILM

2. MODIFICATION

2-1. CHANGING THE RECORDED CONTENTS OF ALIGNMENT TAPE

KRV-52NE (NTSC) (Ver. 1.2)

Time	Video	Audio
20 min.	Recording only at 1 MHz, A-ch. EP mode RF skipping once per 5 frames	5 kHz → 4 kHz full tracks

2-2. TG2 ROLLER, FE HEAD ASSEMBLY (Refer to VHS Mechanical Adjustment Manual Ⅳ page14)

- The TG2 roller is provided with either of two types, fixed or straight. For the fixed type, section 3-5 is added.

3-5. TG2 ROLLER, FE HEAD ASSEMBLY (Fig. 3-5)

1) Remove screw ① to pull out FE head assembly ②.

[Note on Mounting]

- Keep clean the surface contacts tape of TG2 roller.

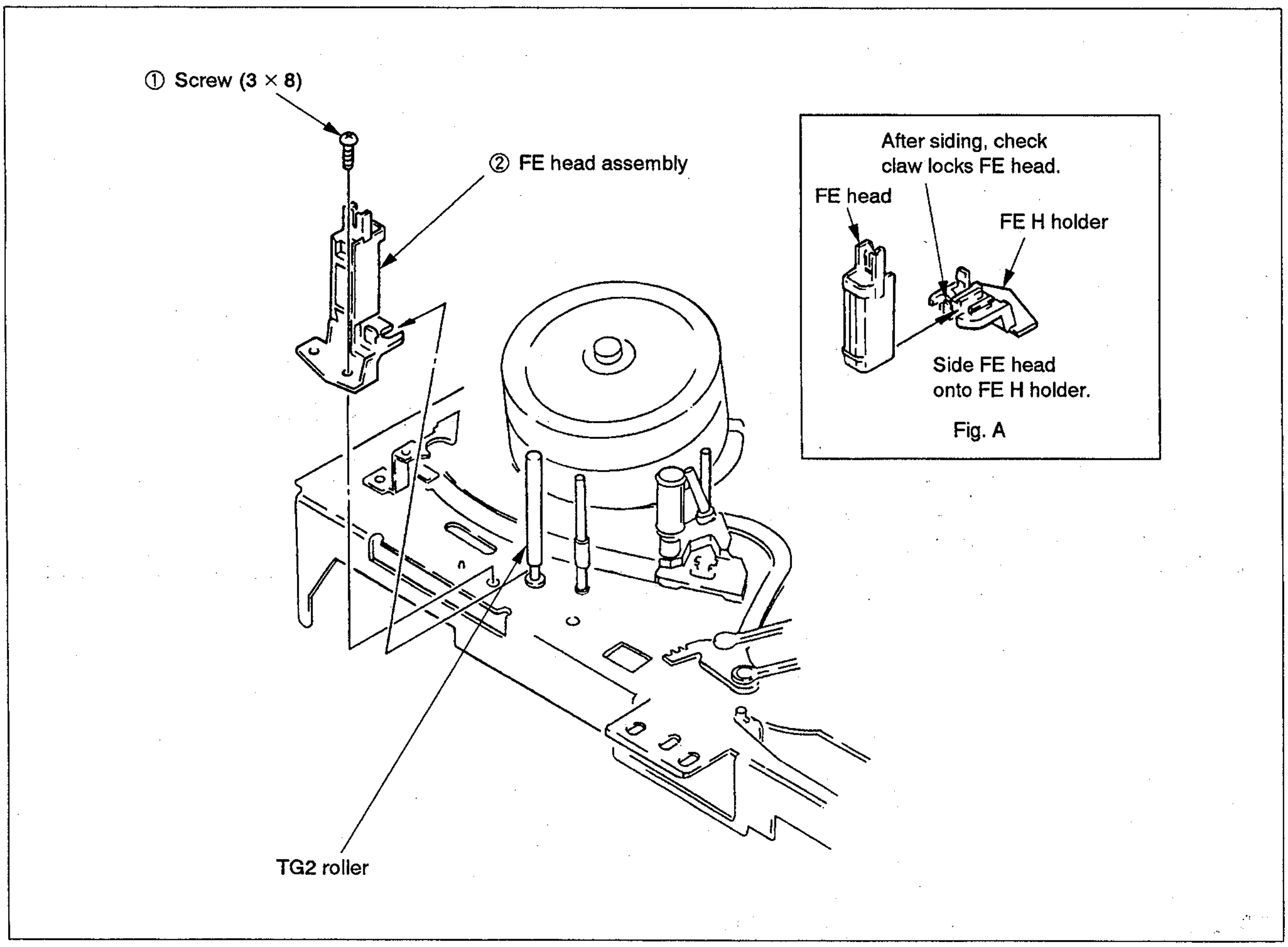
① Screw (3 × 8)
② FE head assembly
TG2 roller
After siding, check claw locks FE head.
FE head
FE H holder
Side FE head onto FE H holder.
Fig. A

Fig. 3-5

2-3. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Refer to VHS Mechanical Adjustment Manual IV page 17)

- There is another type in TG3 and TG6 guide roller assemblies, which is not attached with a screw (B2X3). For the screwless type, section 3-8 is added.

3-8. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Fig. 3-8)

1) TG3 guide roller assembly ① by turning it in arrow Ⓐ direction.
2) Removal the spring ②.
3) TG6 guide roller assembly ③ by turning it in arrow Ⓑ direction.
4) Removal the spring ④.

[Note on Mounting]

- Keep clean the surface contacts tape of TG3 and TG6 guide roller assemblies ①, ③.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

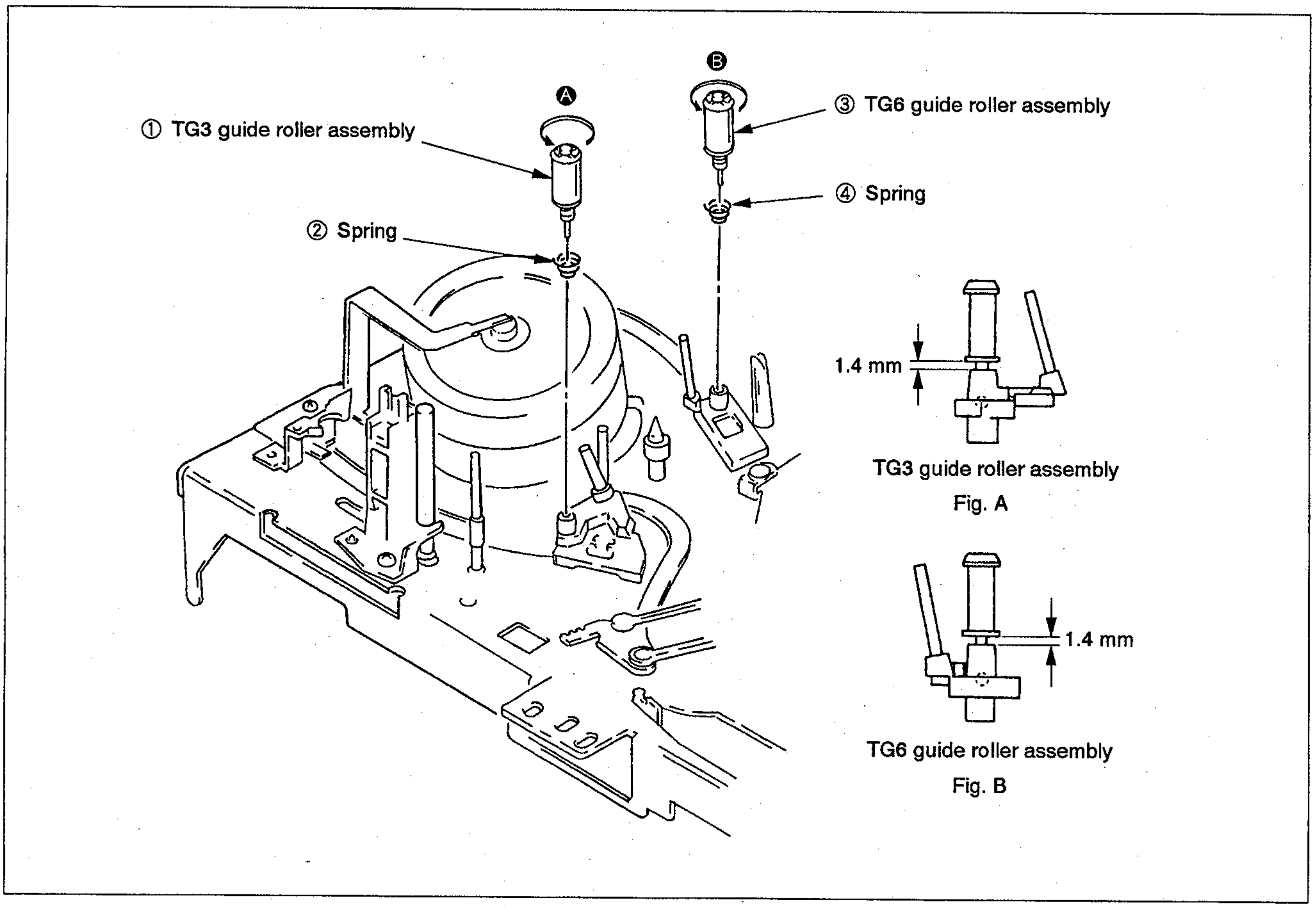
Ⓑ
Ⓐ
③ TG6 guide roller assembly
① TG3 guide roller assembly
④ Spring
② Spring
1.4 mm
TG3 guide roller assembly
Fig. A
1.4 mm
TG6 guide roller assembly
Fig. B

Fig. 3-8

2-4. TG8 ASSEMBLY (Refer to VHS Mechanical Adjustment Manual Ⅳ page 23)

- As the shape of TG8 assembly was changed, Section 3-13 is changed.

☛ : Chenged portion

3-13. TG8 ASSEMBLY (Fig. 3-15)

1) Remove TG7 tape retainer ① to pull out TG8 assembly ②.

[Note on Mounting]

- Apply FLOIL SG-055G (Jig Ref. No. J-12) to ☆ marked portion.
- Keep clean the surface contacts tape of TG8 assembly ②.
- Be careful not to change the shape of TG7 tape retainer ①.
- After attaching the TG7 tape retainer ①, check that side Ⓐ of ① is below side Ⓑ of the stepped-part of the TG7 shaft. (Fig. A)

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

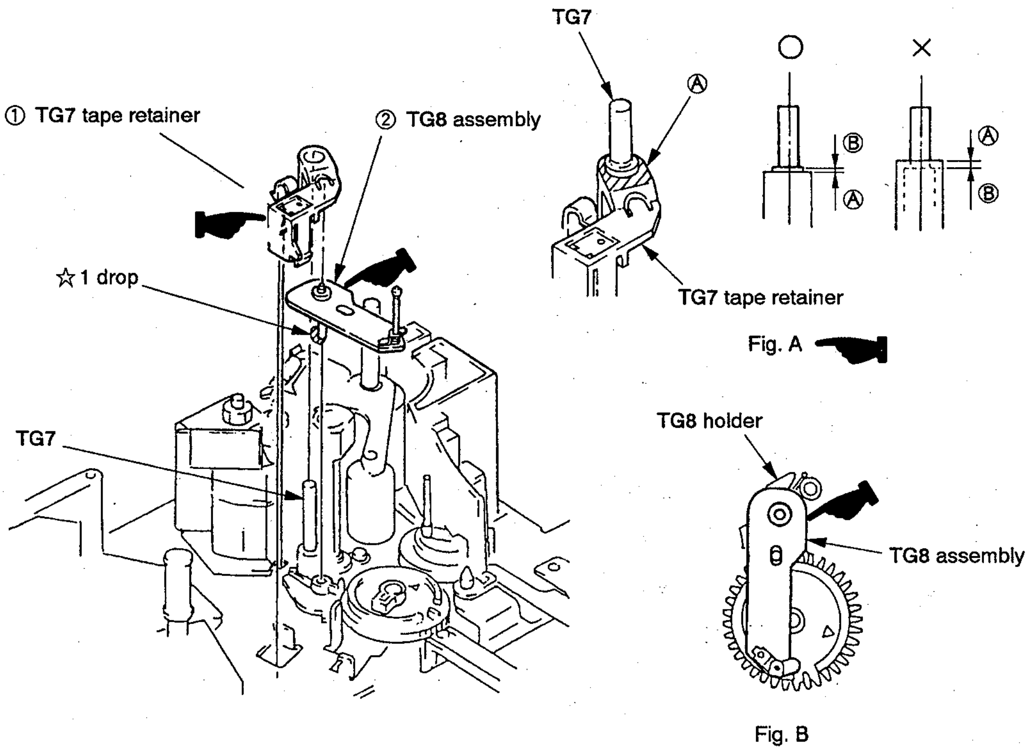
① TG7 tape retainer
② TG8 assembly
☆1 drop
TG7
TG7
Ⓐ
○
×
Ⓑ
Ⓐ
Ⓐ
Ⓑ
TG7 tape retainer
Fig. A
TG8 holder
TG8 assembly
Fig. B

Fig. 3-15

2-5. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Refer to VHS Mechanical Adjustment Manual IV page 35)

- As the tension regulator position and tension adjustment were changed, the tension adjustment and Fig. 4-1 are changed.

☛ : Changed portion

• Tension adjustment

Mode	Playback
Measuring instrument/tool	Torque cassette
Adjustment locations	Position for hooking the tension spring
Specified value	34 ± 4 g•cm ☛

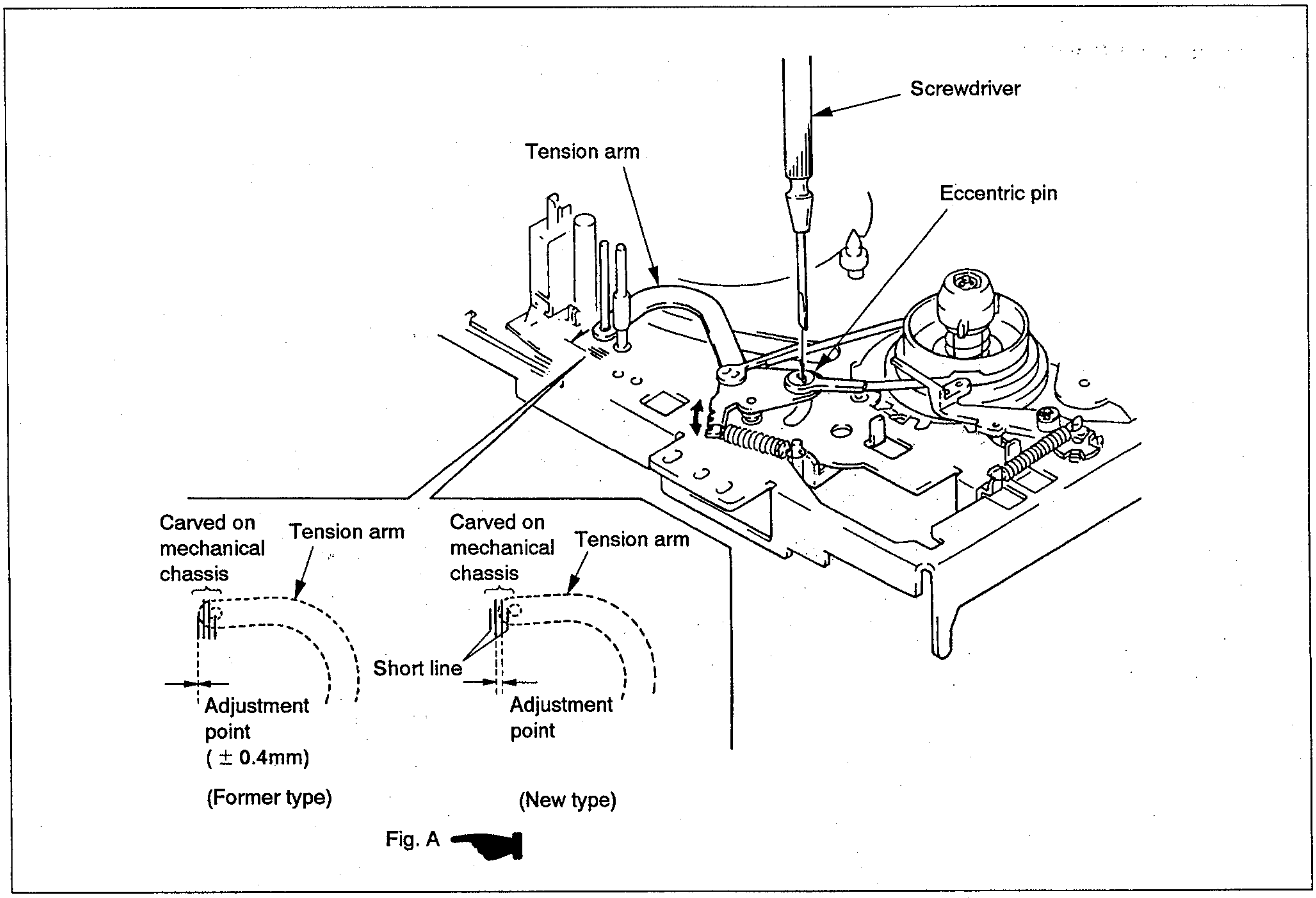
Screwdriver
Tension arm
Eccentric pin
Carved on mechanical chassis
Tension arm
Adjustment point
(± 0.4mm)
(Former type)
Short line
Carved on mechanical chassis
Tension arm
Adjustment point
(New type)
Fig. A

Fig. 4-1

2-6. TG8 GUIDE ROLLER HEIGHT ADJUSTMENT (Refer to VHS Mechanical Adjustment Manual Ⅳ page 36)

- As the use of TG8 height adjusting screw was cancelled, section 4-1-2 is changed.

4-1-2. TG7 TAPE PATH ADJUSTMENT (Fig. 4-2)

[Adjustment Method]

1) Load a tape, and playback the tape in the CUE mode, confirm the distance between lower flange of No. 7 guide roller and lower side of tape (Fig. A).
2) Then, feeding the tape in the REV mode, confirm the distance between lower flange of No. 7 guide roller and lower side of tape.
3) If the tape height in the REV feed is higher that in the CUE playback (Fig. B), rotate the ACE head flapping adjust screw in the direction Ⓐ so that a difference in tape height between CUE mode and REV mode becomes zero.
4) If the tape height in the REV feed is lower that in the CUE playback (Fig. C), rotate the ACE head flapping adjust screw in the direction Ⓑ so that a difference in tape height between CUE mode and REV mode becomes zero.

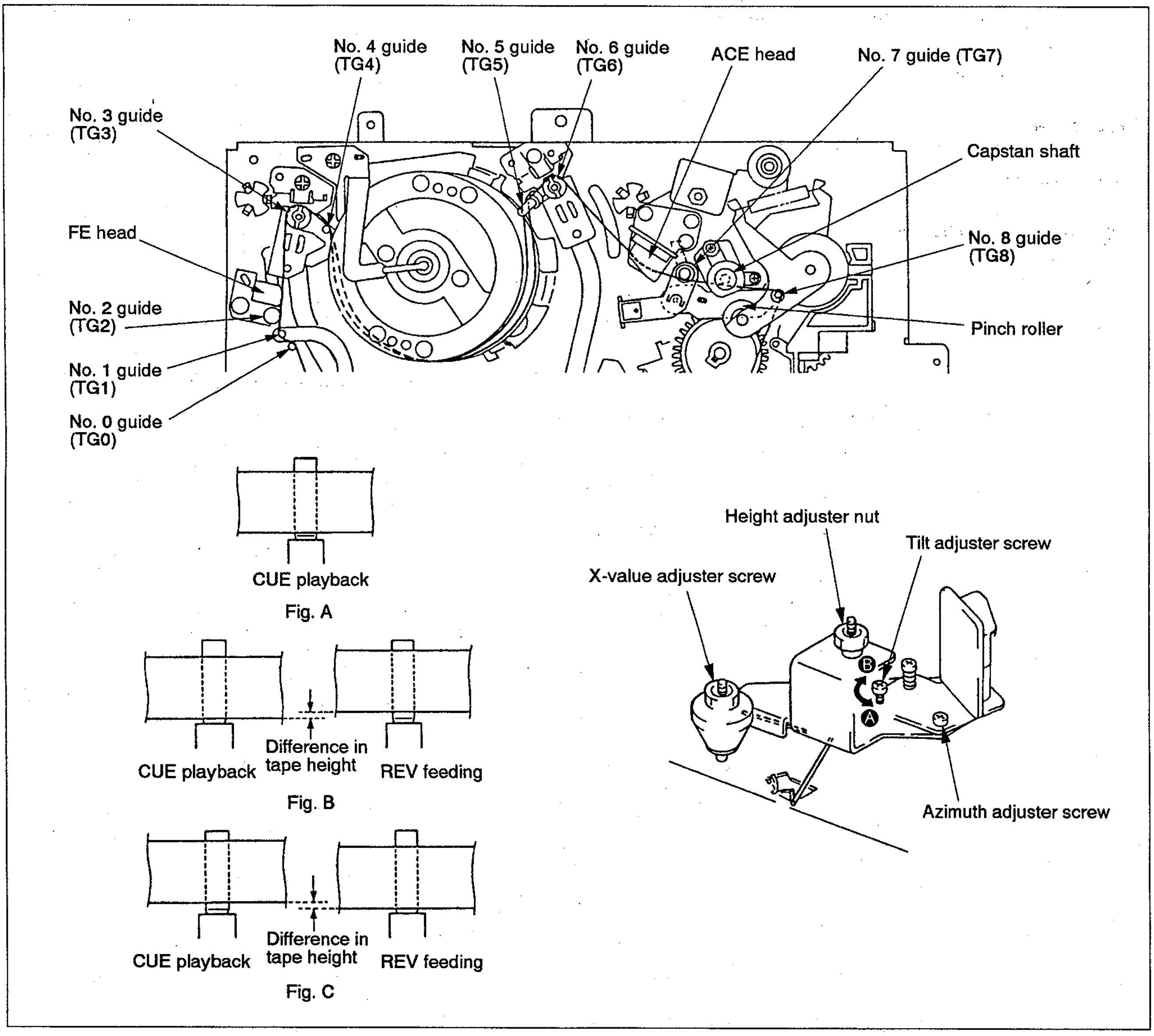
No. 4 guide (TG4)
No. 5 guide (TG5)
No. 6 guide (TG6)
ACE head
No. 7 guide (TG7)
No. 3 guide (TG3)
Capstan shaft
FE head
No. 8 guide (TG8)
No. 2 guide (TG2)
Pinch roller
No. 1 guide (TG1)
No. 0 guide (TG0)
CUE playback
Fig. A
Height adjuster nut
Tilt adjuster screw
X-value adjuster screw
B
A
CUE playback
Difference in tape height
REV feeding
Fig. B
Azimuth adjuster screw
CUE playback
Difference in tape height
REV feeding
Fig. C

Fig. 4-2

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Published by Personal A&V Products Div.
Quality Engineering Dept.

VHS MECHANICAL ADJUSTMENT MANUAL IV

SONY

H MECHANISM

SERVICE MANUAL

SUPPLEMENT-3

File this supplement with the VHS mechanical adjustment IV and supplement-1, 2.

Subject: Mechanism chassis assembly changed.
PAL alignment tape changed.

(SL-600060)

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1. MODIFICATION

1-1. PARTS REQUIRING CLEANING (Refer to VHS Mechanical Adjustment Manual IV page 7)

- Parts requiring a cleaning were changed in shape, and therefore, Fig. 2-1 for new type is added.

☞: Modificated portion

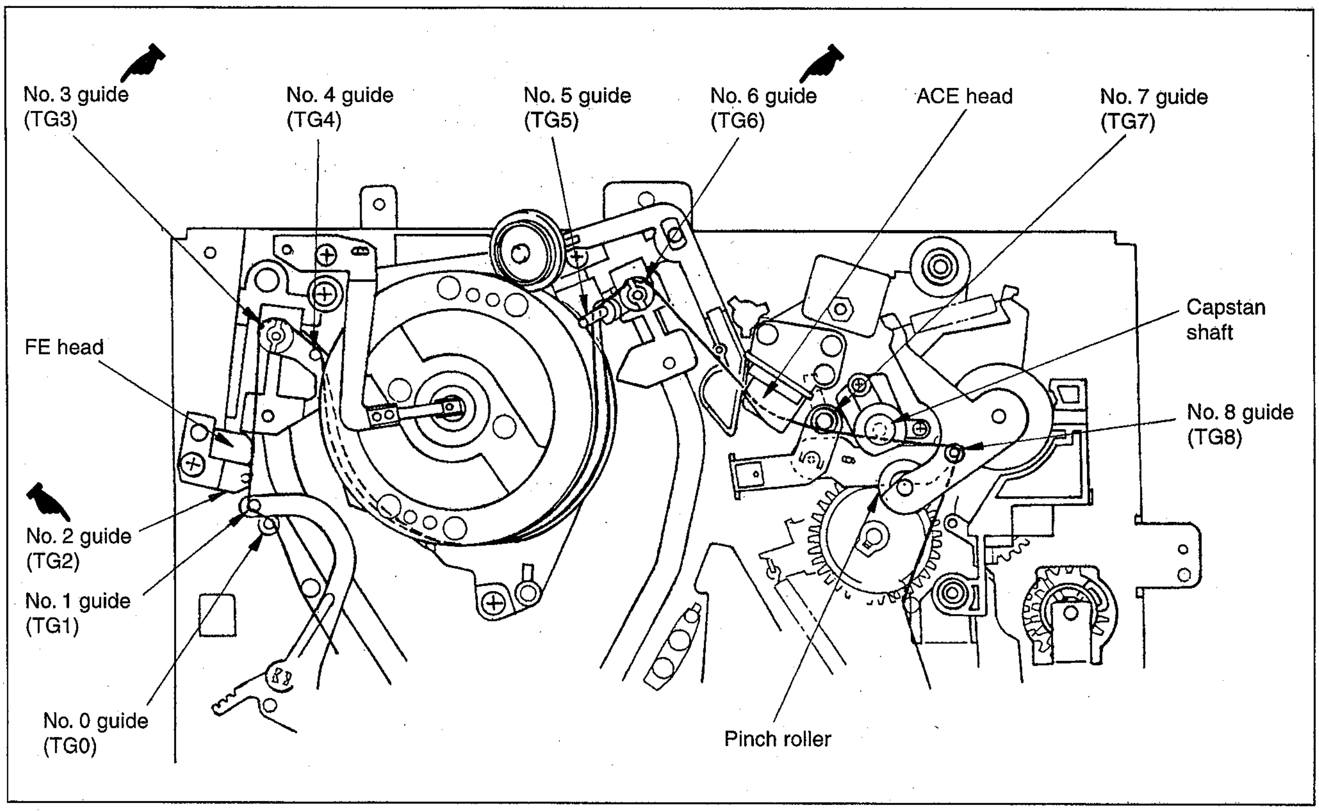

No. 3 guide
(TG3)
No. 4 guide
(TG4)
No. 5 guide
(TG5)
No. 6 guide
(TG6)
ACE head
No. 7 guide
(TG7)
Capstan shaft
FE head
No. 8 guide
(TG8)
No. 2 guide
(TG2)
No. 1 guide
(TG1)
No. 0 guide
(TG0)
Pinch roller

Fig. 2-1 Parts Requiring Cleaning

1-2. DRUM ASSEMBLY, DRUM BASE (Refer to VHS Mechanical Adjustment Manual IV page 11)

- The ground shaft assembly was changed and the drum base was added, and therefore Section 3-2 for new type is added.

3-2. DRUM ASSEMBLY, DRUM BASE (Fig. 3-2)

1) Remove screw ①.
2) Remove ground shaft assembly ② not to touch its tip with bare hand or tools.
3) Remove screws ③ to remove drum assembly ④.
4) Remove screws ⑤ to remove drum base ⑥.

[Note on Mounting]

- Don't touch head chips and ground shaft assembly ④ with bare hand or tools.
- Keep clean the surface contacts tape of drum assembly ④.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

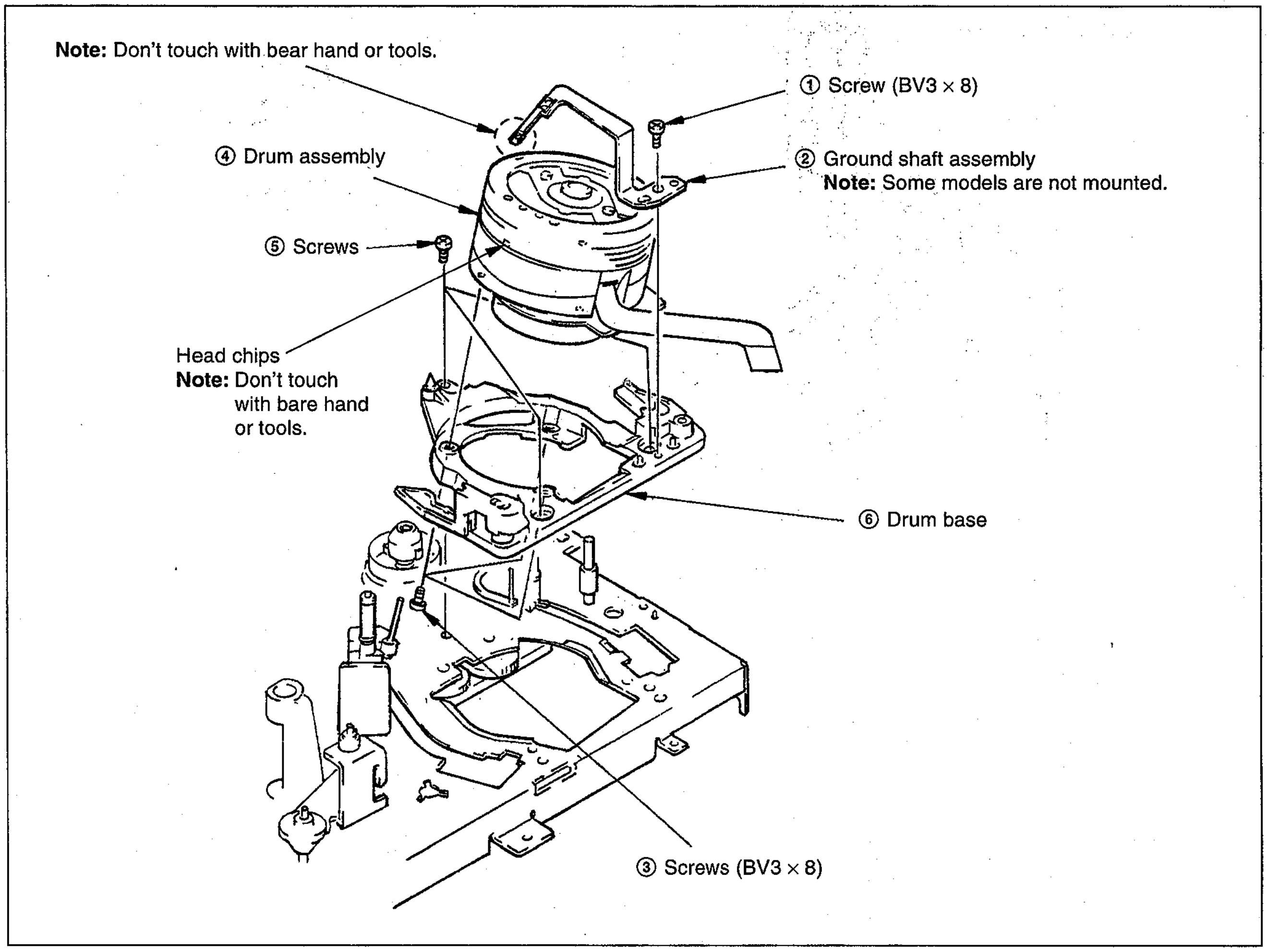

Note: Don't touch with bear hand or tools.
① Screw (BV3 × 8)
④ Drum assembly
② Ground shaft assembly
Note: Some models are not mounted.
⑤ Screws
Head chips
Note: Don't touch with bare hand or tools.
⑥ Drum base
③ Screws (BV3 × 8)

Fig. 3-2

1-3. TG2 ROLLER, FE HEAD ASSEMBLY (Refer to VHS Mechanical Adjustment Manual IV page 14)

- The TG2 roller was assembled in the FE head assembly, and therefore Section 3-5 for new type is added.

3-5. TG2 ROLLER, FE HEAD ASSEMBLY (Fig. 3-5)

1) Remove screw ①.
2) Pull out FE head assembly ②.

[Note on Mounting]

- Keep clean the surface contacts tape of TG2 roller.

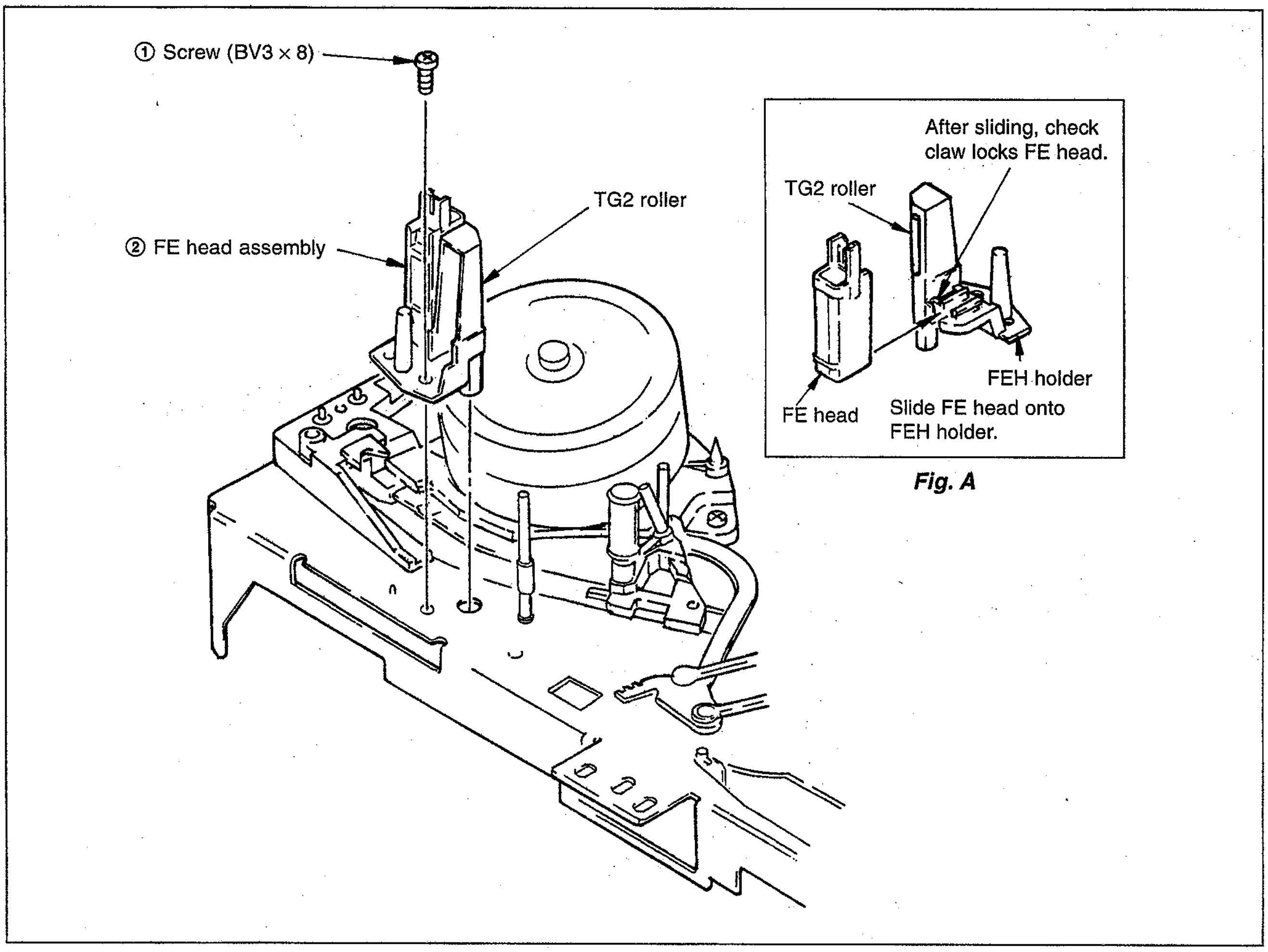

① Screw (BV3 × 8)
② FE head assembly
TG2 roller
After sliding, check claw locks FE head.
TG2 roller
FEH holder
FE head
Slide FE head onto FEH holder.
Fig. A

Fig. 3-5

1-4. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Refer to VHS Mechanical Adjustment Manual IV page 17)

- The TG3 and TG6 guide roller assemblies were changed, and therefore Section 3-8 for new type is added.

3-8. TG3, TG6 GUIDE ROLLER ASSEMBLIES (Fig. 3-8)

1) TG3 guide roller assembly ① by turning it in the arrow Ⓐ direction.
2) Removal the spring ②.
3) TG6 guide roller assembly ③ by turning it in the arrow Ⓑ direction.
4) Removal the spring ④.

[Note on Mounting]

- Keep clean the surface contacts tape of TG3 and TG6 guide roller assemblies ①, ③.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

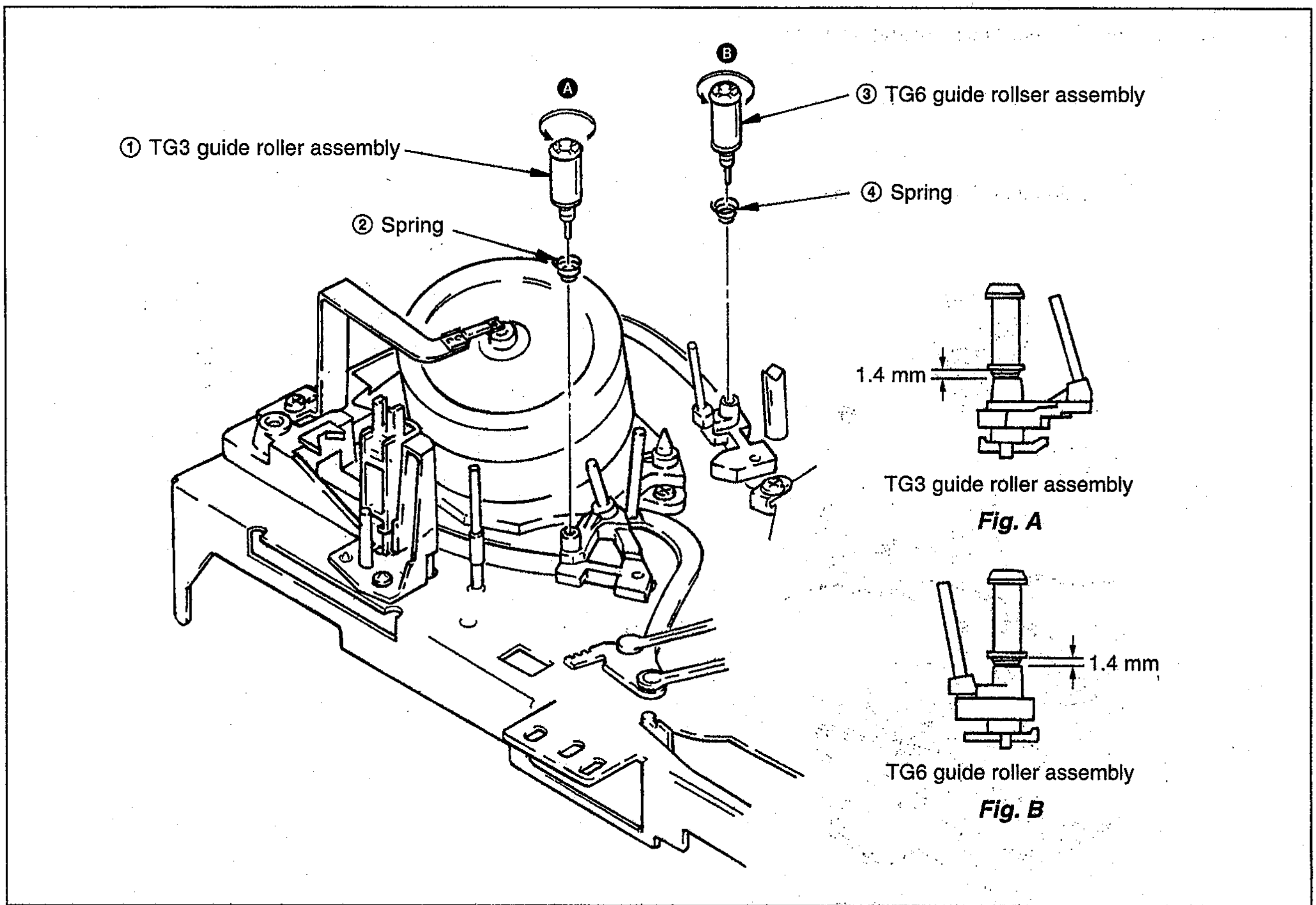

Ⓑ
Ⓐ
③ TG6 guide rollser assembly
① TG3 guide roller assembly
④ Spring
② Spring
1.4 mm
TG3 guide roller assembly
Fig. A
1.4 mm
TG6 guide roller assembly
Fig. B

Fig. 3-8

1-5. SHUTTLE T BLOCK AND LOADING GEAR T BLOCK ASSEMBLIES (Refer to VHS Mechanical Adjustment Manual IV page 29)

- The shuttle T block and loading gear T block assemblies were changed, and therefore Section 3-19 for new type is added.

3-19. SHUTTLE T BLOCK AND LOADING GEAR T BLOCK ASSEMBLIES (Fig. 3-21)

1) Remove drum assembly and drum base. (Refer to 3-2.)
2) Remove timing belt. (Refer to 3-3.)
3) Remove CAP brake assembly. (Refer to 3-4.)
4) Remove cam motor chassis block assembly. (Refer to 3-18.)
5) Remove main slider. (Refer to 3-20.)
6) Sliding the shuttle T block assembly ① toward the direction Ⓐ, remove it through the hole Ⓑ.
7) Pull out loading gear T block assembly ②.

[Note on Mounting]

- Adjust the phase Ⓒ between loading gear (T) and loading gear (S). (Fig. A)
- Keep clean the surface contacts tape of shuttle T block assembly ①.

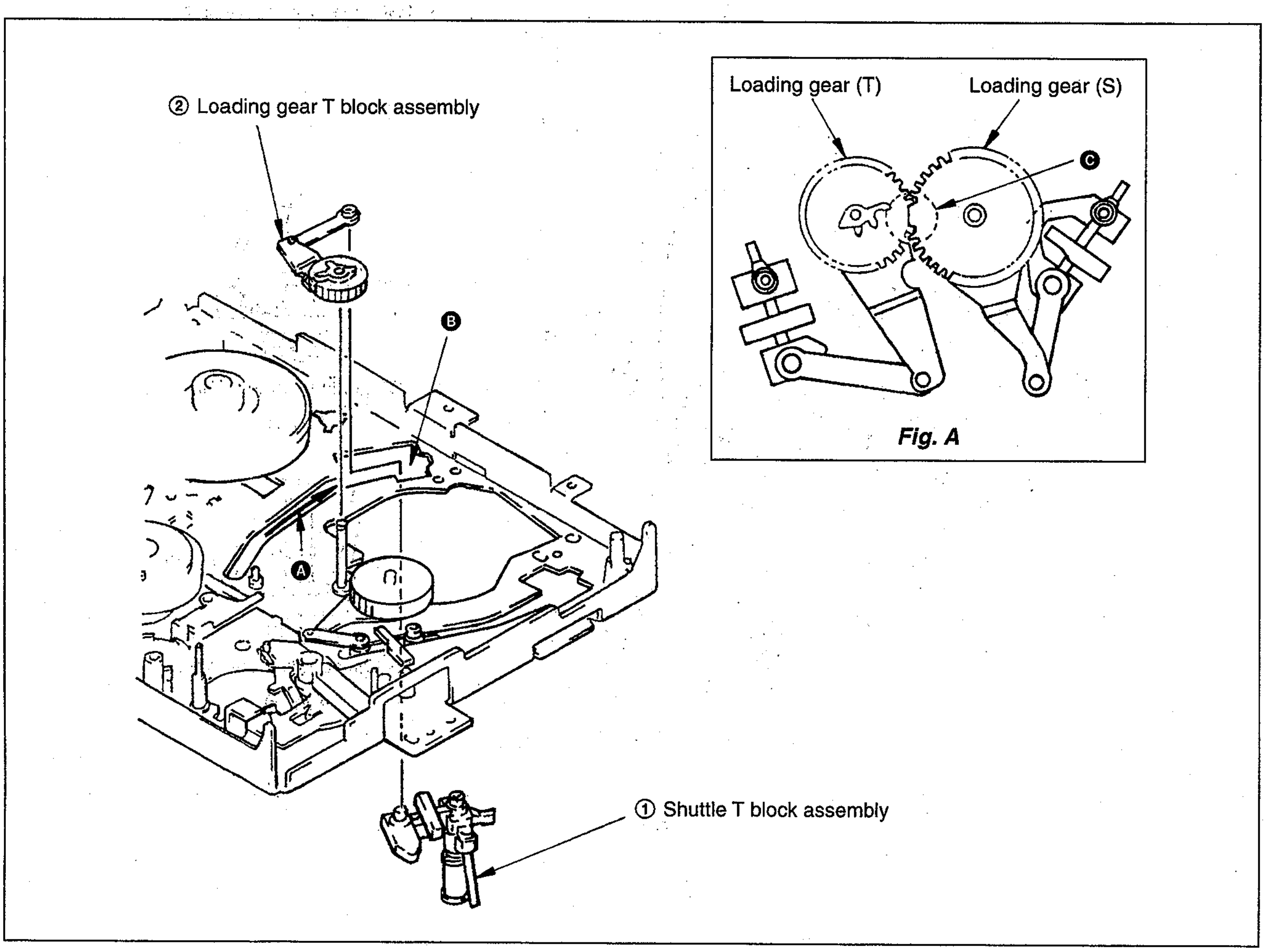

② Loading gear T block assembly
Ⓑ
Ⓐ
① Shuttle T block assembly
Loading gear (T)
Loading gear (S)
Ⓒ

Fig. A

Fig. 3-21

1-6. SHUTTLE S BLOCK AND LOADING GEAR S BLOCK ASSEMBLIES (Refer to VHS Mechanical Adjustment Manual IV page 30)

- The shuttle S block and loading gear S block assemblies were changed, and therefore Section 3-20 for new type is added.

3-20. SHUTTLE S BLOCK AND LOADING GEAR S BLOCK ASSEMBLIES (Fig. 3-22)

1) Remove drum assembly and drum base. (Refer to 3-2.)
2) Remove timing belt. (Refer to 3-3.)
3) Remove CAP brake assembly. (Refer to 3-4.)
4) Remove cam motor chassis block assembly. (Refer to 3-18.)
5) Remove main slider. (Refer to 3-20.)
6) Sliding the shuttle S block assembly ① toward the direction 🅐, remove it through the hole 🅑.
7) Pull out loading gear S block assembly ②.

[Note on Mounting]

- Adjust the phase 🅒 between loading gear (S) and loading gear (S). (Fig. A)
- Keep clean the surface contacts tape of shuttle S block assembly ①.

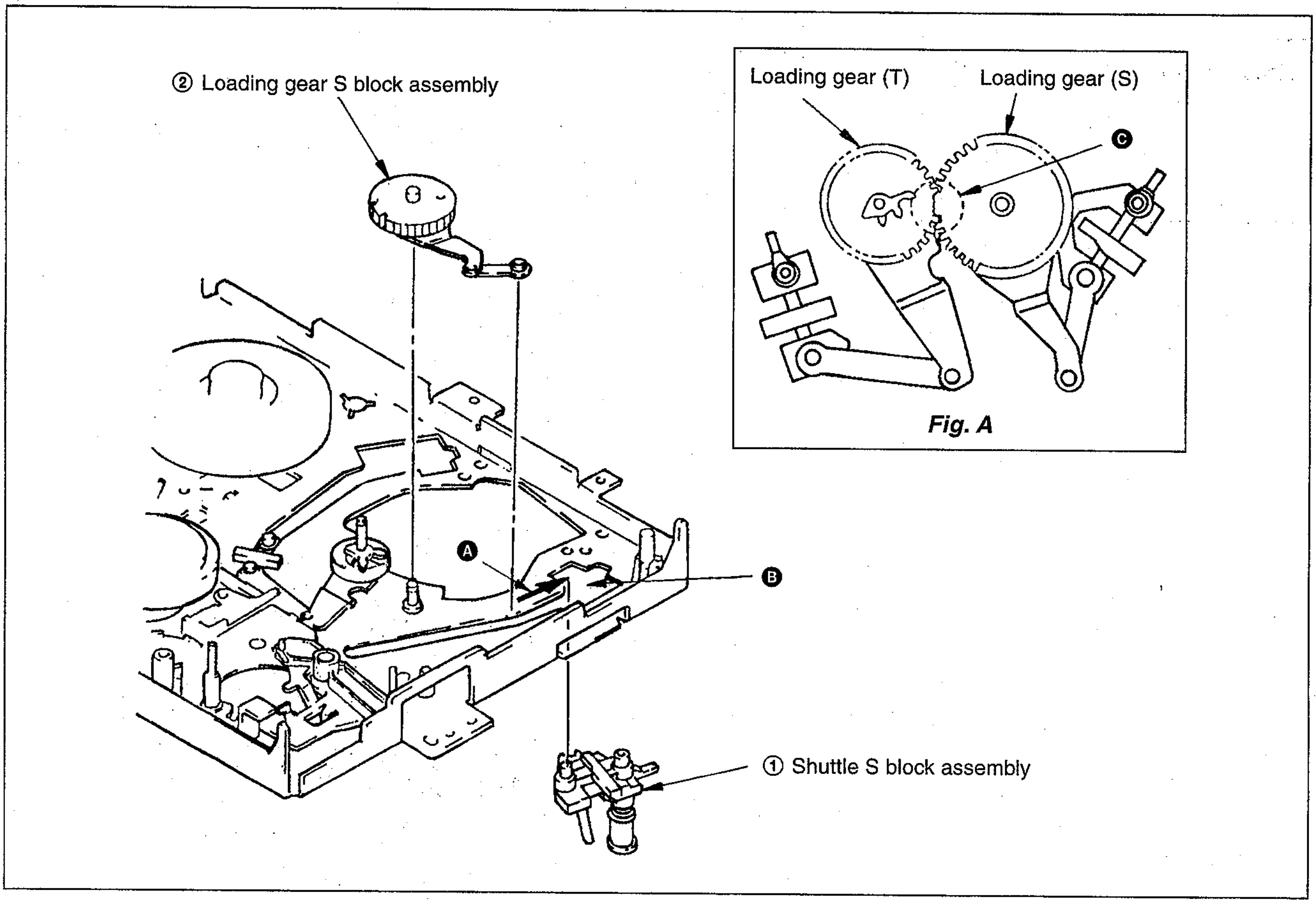

② Loading gear S block assembly
Loading gear (T)
Loading gear (S)
🅒
Fig. A
🅐
🅑
① Shuttle S block assembly

Fig. 3-22

2. ADJUSTING THE MECHANISM USING NEW ALIGNMENT TAPE (KRV-52PL for PAL)

The conventional alignment tape (For PAL) is now replaced with alignment tape KRV-52PL, and the following describes how to align the mechanism using the KRV-52PL. For details on the use of KRV-51P for each model, refer to the service manuals which will be issued in the future.

Name	Parts No.	Remarks
Alignment tape KRV-52PL for PAL	8-192-605-46	For tape path, audio azimuth, and X-value adjustments
Alignment tape KRV-51P for PAL	8-192-605-36	For electrical adjustments (RF, AF, and switching position) and operation check

Contents:
KRV-52PL (PAL)

Time	Video	Audio
20 min.	Recording only at 1 MHz, A-ch. EP mode RF skipping once per 5 frames	4 kHz full tracks

KRV-51P (PAL)

Class	Mode	Time	Video	Audio (HiFi/Normal)
1	SP	7 min.	Color bar	400 Hz
2	SP	3 min.	Mono. scope	400 Hz
3	EP	7 min.	Color bar	400 Hz
4	EP	3 min.	Mono. scope	400 Hz

2-1. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6

Mode	Playback
Signal	Alignment tape KRV-52PL (For PAL)
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	Height adjustment screw for No. 3 tape guide roller Height adjustment screw for No. 6 tape guide roller

[Adjustment Method]

1) Deactivate the automatic tracking control, and set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).
2) Turn the height adjustment screws of tape guide rollers No. 3 and No. 6 so that the RF output envelope becomes as flat as possible.
3) Press the ▲ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.
4) Press the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

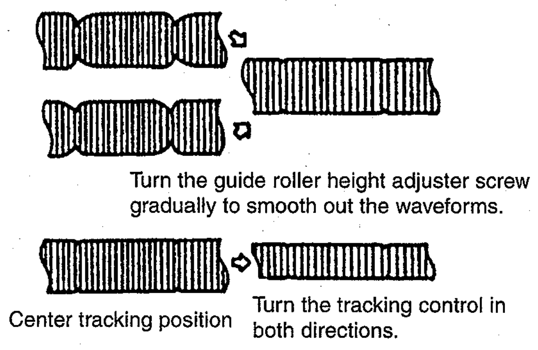

Turn the guide roller height adjuster screw gradually to smooth out the waveforms.
Center tracking position
Turn the tracking control in both directions.

Fig. 2-1

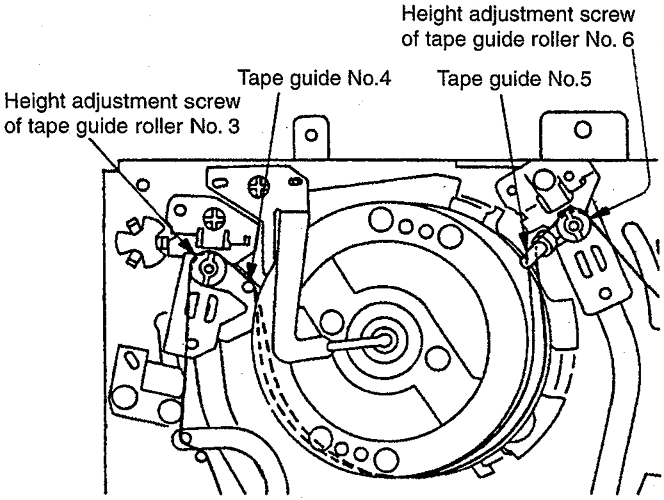

Height adjustment screw of tape guide roller No. 6
Tape guide No.4
Tape guide No.5
Height adjustment screw of tape guide roller No. 3

Fig. 2-2

2-2. ACE HEAD ASSEMBLY ADJUSTMENT (ROUGH ADJUSTMENT) (Figs. 2-3 and 2-4)

Purpose: Allows the tape to make even contract with the head for recording and playback of the specified track.

Mode	Playback
Jig	Blank tape
Adjustment locations	Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Mount the ACE head assembly. AT this time, adjust the height so that the height of guide flange No. 7 matches the level of the lower edge of the control head.
2) Remove the adjustment tool and load a new tape, then set the unit for playback.
3) Check that the tape does not curl or rise up noticeably near the ACE head.
4) If the tape curls up or rises noticeably, readjust the tilt adjuster screw and the height adjuster nut.
(The height of the ACE head should be adjusted so that the lower edge of the tape is approx. 0.1 to 0.15 mm from the control head.)
5) Perform precision adjustment.

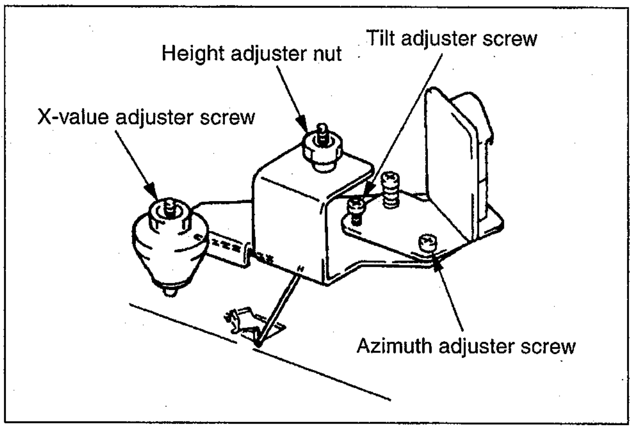

Height adjuster nut
Tilt adjuster screw
X-value adjuster screw
Azimuth adjuster screw

Fig. 2-3

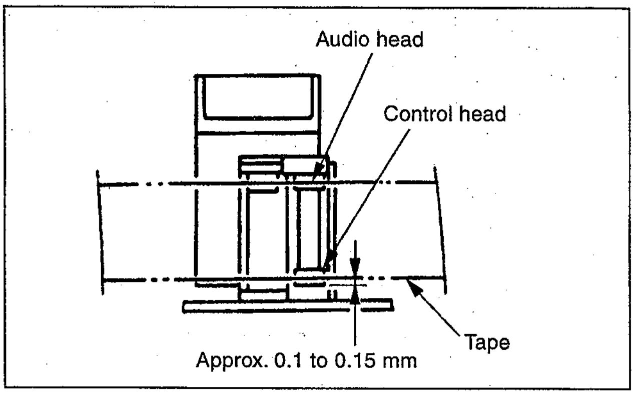

Audio head
Control head
Tape
Approx. 0.1 to 0.15 mm

Fig. 2-4

2-3. ACE HEAD ASSEMBLY ADJUSTMENT (PRECISION ADJUSTMENT)

Mode	Playback
Signal	Alignment tape (KRV-52PL 4 kHz) (For PAL)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster nut, Tilt adjuster screw

[Adjustment Method]

1) Adjust the tilt adjuster screw in the FWD or REV mode so that the lower flange of guide No. 7 does not curl up or rise.
2) Alternately adjust the azimuth adjuster screw, the height adjuster nut, and the tilt adjuster screw to maintain even audio output at maximum with minimum deviation.

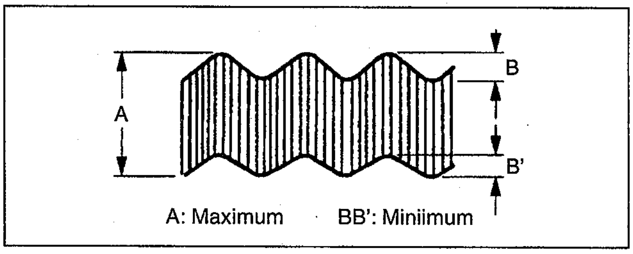

A
B
B'
A: Maximum
BB': Miniimum

Fig. 2-5

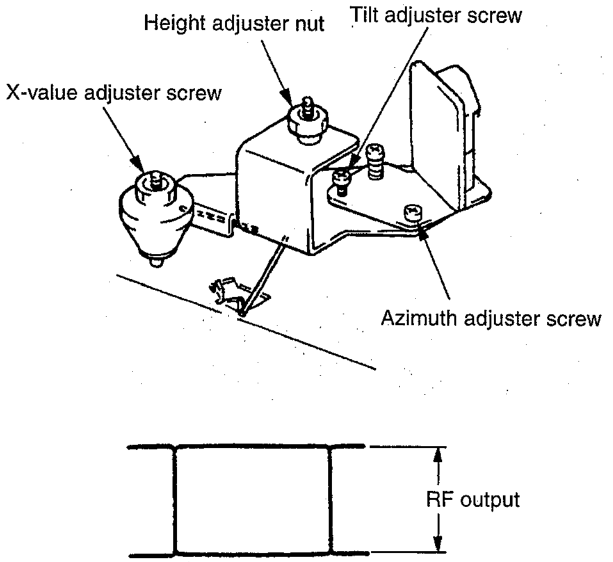
Note: In the adjustment of ACE head assembly (coarse adjustment and fine adjustment), if a azimuth, height and tilt were adjusted, again adjust the height of No. 3 and No. 6 guide rollers.

2-4. X-VALUE ADJUSTMENT

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape KRV-52PL
Measuring instrument	Oscilloscope TIM/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH-1: Connector PB RF pin for RF PC board check CH-2: Connector RF SWP pin for RF PC board check
Adjustment locations	X-value adjuster screw



RF output shall be maximum at the center position of the tracking control.

Fig. 2-6

[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with narrow gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

1. Adjusting X-value

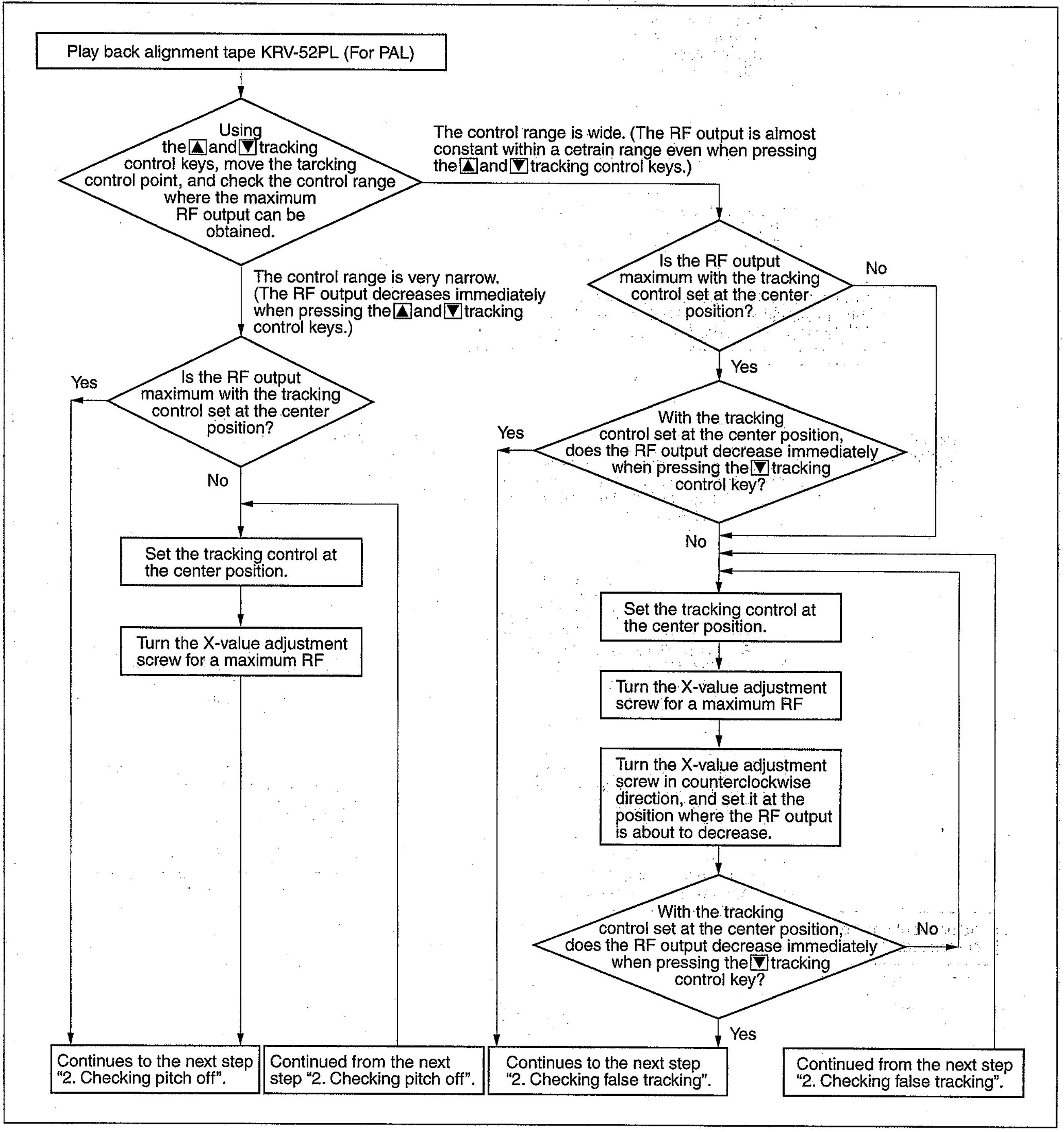
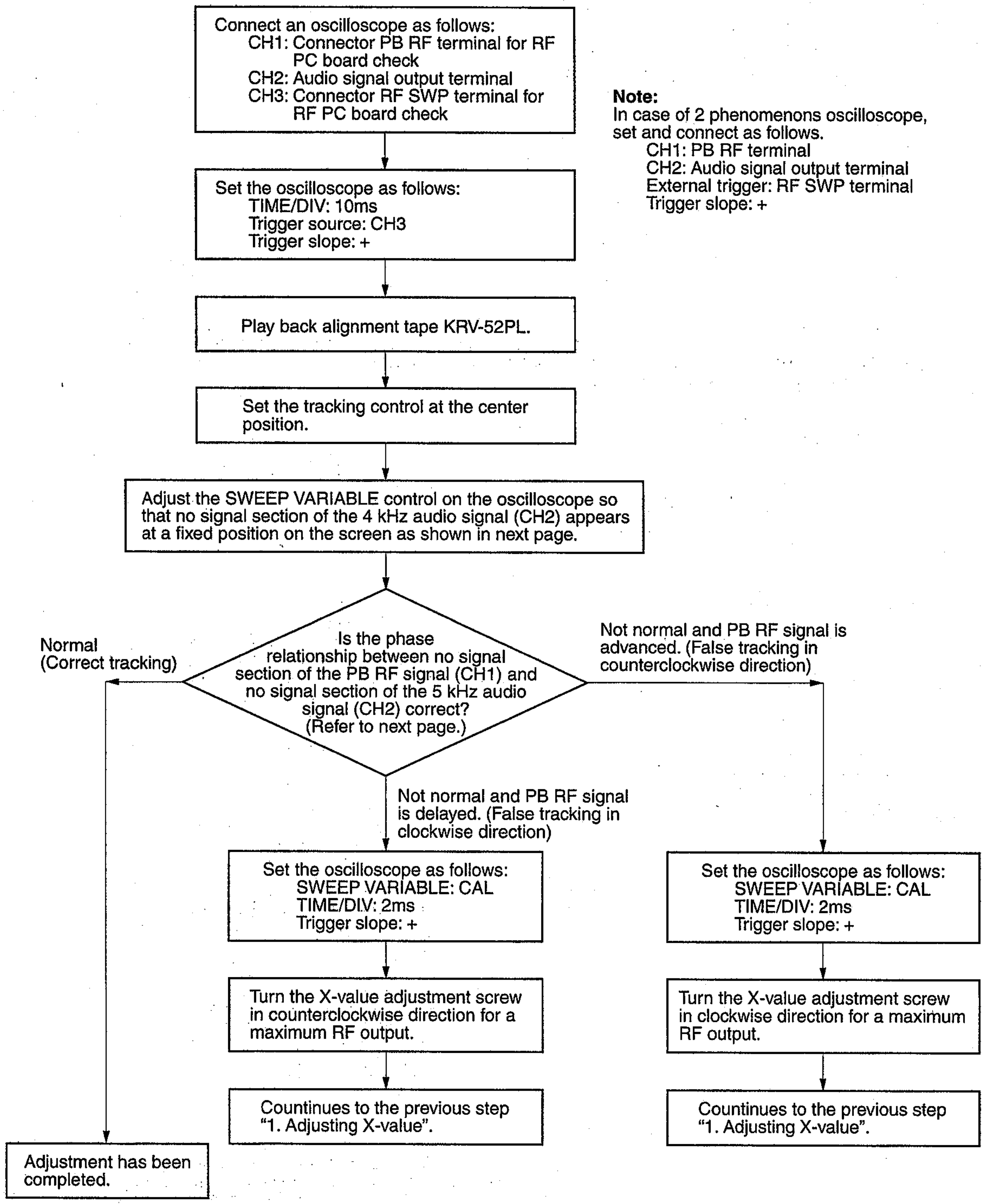

Play back alignment tape KRV-52PL (For PAL)
Using the ▲ and ▼ tracking control keys, move the tarcking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a cetrain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Is the RF output maximum with the tracking control set at the center position?
No
Yes
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjustment screw for a maximum RF
Turn the X-value adjustment screw in counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
No
Yes
Continues to the next step "2. Checking pitch off".
Continued from the next step "2. Checking pitch off".
Continues to the next step "2. Checking false tracking".
Continued from the next step "2. Checking false tracking".

Fig. 2-7

2. Checking false tracking


Connect an oscilloscope as follows:
CH1: Connector PB RF terminal for RF PC board check
CH2: Audio signal output terminal
CH3: Connector RF SWP terminal for RF PC board check
Set the oscilloscope as follows:
TIME/DIV: 10ms
Trigger source: CH3
Trigger slope: +
Play back alignment tape KRV-52PL.
Set the tracking control at the center position.
Adjust the SWEEP VARIABLE control on the oscilloscope so that no signal section of the 4 kHz audio signal (CH2) appears at a fixed position on the screen as shown in next page.
Is the phase relationship between no signal section of the PB RF signal (CH1) and no signal section of the 5 kHz audio signal (CH2) correct? (Refer to next page.)
Normal (Correct tracking)
Not normal and PB RF signal is advanced. (False tracking in counterclockwise direction)
Not normal and PB RF signal is delayed. (False tracking in clockwise direction)
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +
Turn the X-value adjustment screw in counterclockwise direction for a maximum RF output.
Countinues to the previous step "1. Adjusting X-value".
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +
Turn the X-value adjustment screw in clockwise direction for a maximum RF output.
Countinues to the previous step "1. Adjusting X-value".
Adjustment has been completed.

Note:
In case of 2 phenomenons oscilloscope, set and connect as follows.
CH1: PB RF terminal
CH2: Audio signal output terminal
External trigger: RF SWP terminal
Trigger slope: +

Fig. 2-8

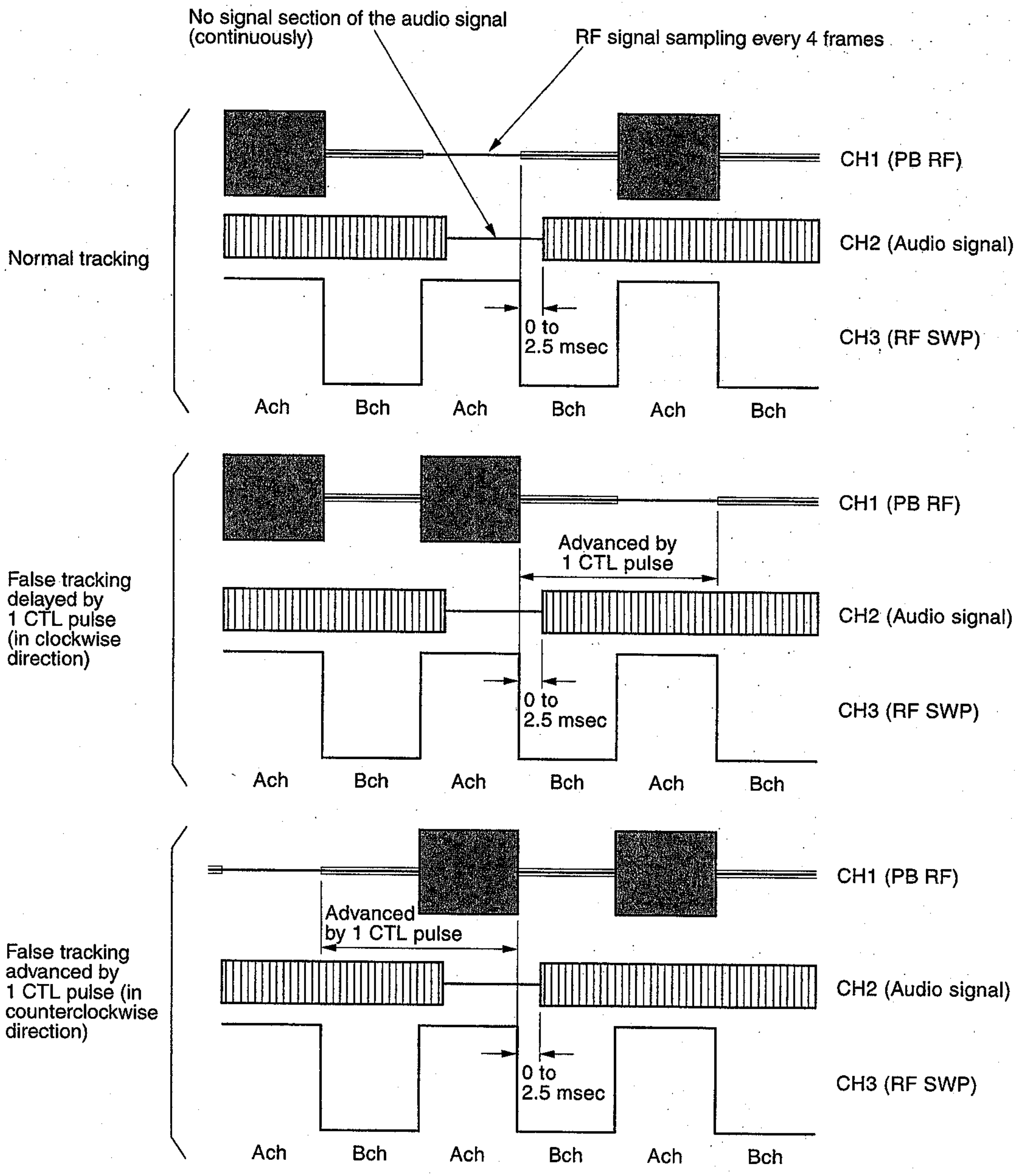

No signal section of the audio signal (continuously)
RF signal sampling every 4 frames
Normal tracking
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
0 to 2.5 msec
Ach
Bch
Ach
Bch
Ach
Bch
False tracking delayed by 1 CTL pulse (in clockwise direction)
Advanced by 1 CTL pulse
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
0 to 2.5 msec
Ach
Bch
Ach
Bch
Ach
Bch
False tracking advanced by 1 CTL pulse (in counterclockwise direction)
Advanced by 1 CTL pulse
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
0 to 2.5 msec
Ach
Bch
Ach
Bch
Ach
Bch

Fig. 2-9

2-5. ADJUSTMENT AFTER REPLACING THE DRUM (VIDEO HEAD)

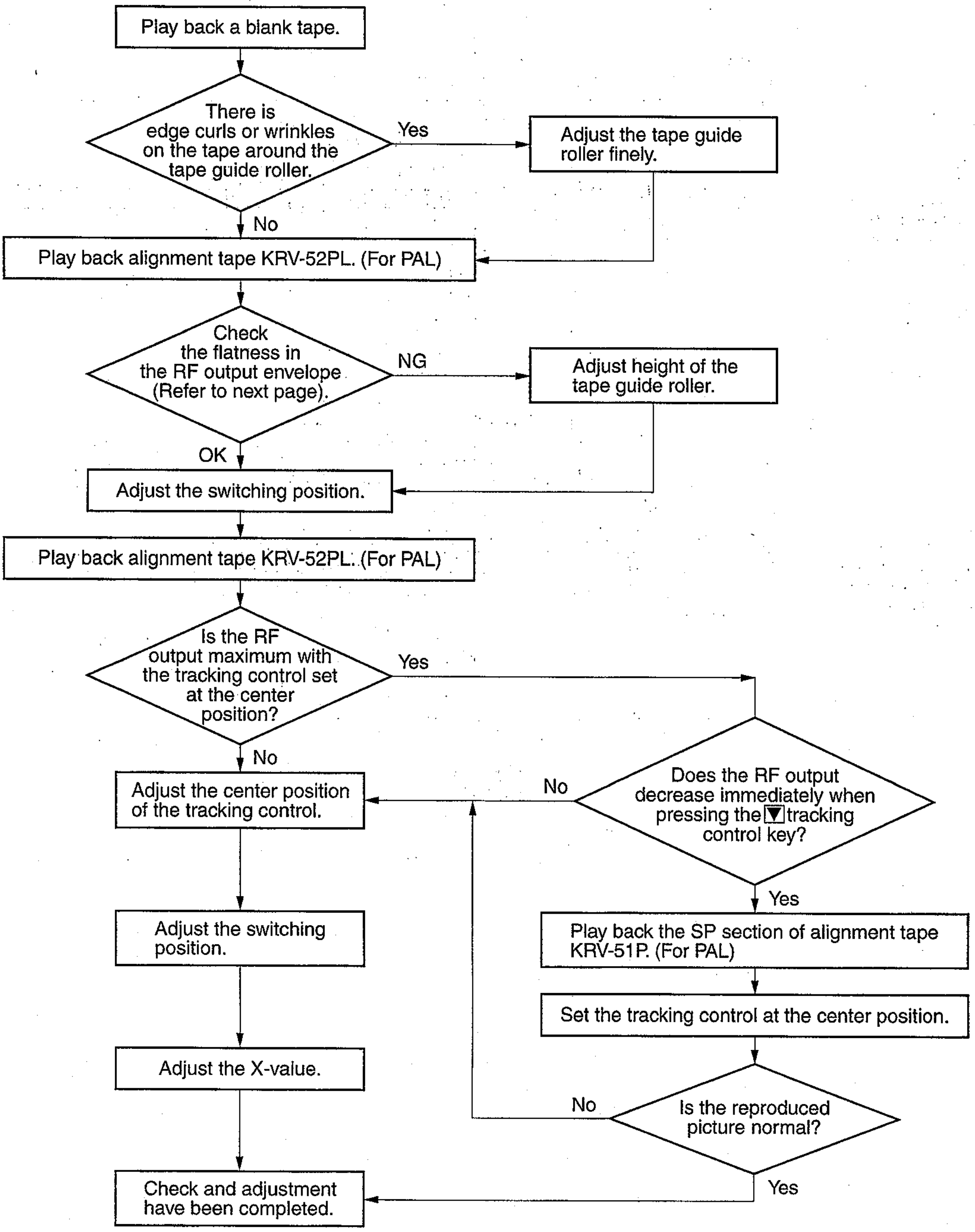
Purpose: Co-relative height, X-value and other factors of the drum will deviate from those of the guide roller. If the drum is replaced properly, these deviations are extremely small.

Note 1: Deactivate the automatic tracking control for setting the mechanism in manual tracking control mode.

Note 2: To set the tracking control at the center position, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape KRV-52PL (For PAL), blank tape
Measuring instrument	Oscilloscope
Measuring point	CH-1: Connector PB RF pin for RF PC board check. CH-2: Connector RF SWP pin for RF PC board check.
Adjustment locations	Guide roller (Refer to 2-1.) Switching position (Refer to the Service Manual) X-value (Refer to 2-3.)

[Adjustment Method]

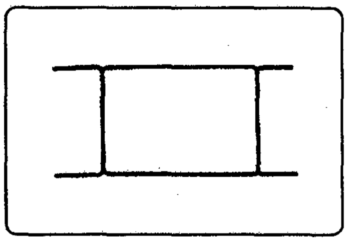


Play back a blank tape.
There is edge curls or wrinkles on the tape around the tape guide roller.
Yes
Adjust the tape guide roller finely.
No
Play back alignment tape KRV-52PL. (For PAL)
Check the flatness in the RF output envelope (Refer to next page).
NG
Adjust height of the tape guide roller.
OK
Adjust the switching position.
Play back alignment tape KRV-52PL. (For PAL)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Adjust the center position of the tracking control.
No
Does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
Play back the SP section of alignment tape KRV-51P. (For PAL)
Set the tracking control at the center position.
Adjust the switching position.
Adjust the X-value.
No
Is the reproduced picture normal?
Yes
Check and adjustment have been completed.

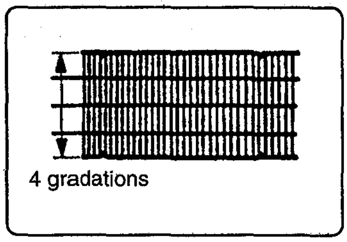
Fig. 2-10

[Checking the evenness and fluctuation of the RF output]

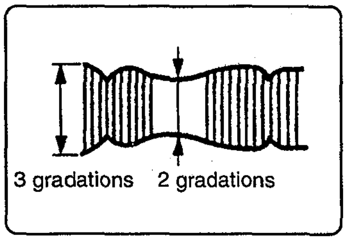
1) Set the RF output to the maximum level using the tracking buttons.



2) Perform fine adjustment of the voltage level range of the oscilloscope, then adjust the RF output deviation to within 4 gradations.



3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 3 gradations.
4) AT this time, check if the minimum amplitude is more than 2 gradations.



5) Check that the RF output fluctuation between minimum and maximum levels is within 13%.

Fig. 2-11